The Builder.

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Berlin Street Architecture:—

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Westminster Hotel, Berlin.—Messrs. Cremer & Wolffenstein, Architects ..... *Double-Page Ink-Photo.*
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"*Rational Building.*"

ALTHOUGH the Mediæval system of building was no doubt governed by a severe logic both in regard to construction and design, one would scarcely have expected to find that the title "Rational Building" covered nothing more than a translation of the article "Construction" in Viollet-le-Duc's "Dictionnaire."* In that work the title "Construction" correctly defined the scope of the article, inasmuch as the Dictionary was one of Gothic architecture only; Viollet-le-Duc's reasoning being something like the celebrated definition of "religion," which was found to be only another name for the Church of England. Viollet-le-Duc seems to argue, "When I say architecture, I mean French architecture; and when I say French architecture I mean French Gothic architecture"; and bearing that in mind, the article "Construction" means the construction adopted in French Gothic. If the article were published separately, the title "Construction" would be much too large for the subject. The American translator, not content with that, has adopted a still more comprehensive title; and asks us to apply the term "Rational building" to the method of construction adopted in one country during a period of two or three centuries. The frame is a great deal too large for the picture, and suggests something quite different from the actual contents of the book; though it forms, no doubt, a good title to catch the eye in a publisher's list.

Mr. Huss tells in his preface that when making free use of the information contained in the article "Construction" while preparing drawings for a large Cathedral Church in New York, the idea occurred to him of translating the article. The use said to have been made of the article is, like the article itself, rather *passé*, though not quite in the same sense. The use of an analysis of the method of constructing French churches in the twelfth and thirteenth centuries as an aid to building an American church in the nineteenth century, hardly seems like the path to "rational" architecture. The essay itself is *passé* for architects, in the sense that we know it all now; it seems like a series of elaborate proofs of facts that every mature student of architecture is familiar with; and, therefore, for architects, it is hardly worth while at this time of day to translate it into English. Non-professional readers, on the other hand, will neither understand nor care for it. The persons to whom it will be of service are students, in the more limited sense of the word; young persons in training as architects, who want a good study-book for the processes of Mediæval construction, who may not read French easily, and who in any case can only get the "Dictionnaire" in a library. For these the translation will be a boon, and it may well take its place as a recognised text-book of the subject; the illustrations also give it a certain permanent value for more experienced readers, though we must say that we think Viollet-le-Duc's illustrations must be taken with a good many grains of salt, and that he was rather prone to arrange them as he wanted them, a weakness in which he was certainly not alone among French writers on architecture.

As a text-book for young students, however, this is an excellent book, both on account of its clear analysis of the methods and development of Gothic construction, and also because Viollet-le-Duc's method of illustrating, whether or not we entirely accept the historical accuracy of all his representations, is so thoroughly architectural, so well calculated to make the student think about and realise the method of putting the stones together in arched masonry construction of this type. It is a satisfaction to note that Viollet-le-Duc had not that narrowness of view which besets too many French writers on architecture, who can see nothing but what is French. Viollet-le-Duc, in treating mainly of French Gothic, was at all events aware that there was such a thing as English Gothic, which has its own special characteristics. He does not commit the absurdity of M. Corroyer, of ignoring the very existence of the peculiarly English type of late vaulting, the fan vault; on the contrary, he traces out its development as the logical and natural result of what had preceded it. And he further shows how something of the same principle is to be seen in Late French vaulting, so far as details are concerned, although the fan form, with its important suppression of the ribs as *structural* elements, was not adopted. "The system of Gothic vaults had come to this, which was necessarily its last mode of expression. To close the intervals left between the arches by ceilings, and, when necessary, multiply the arches until there were no spaces left among them which could not be filled by one or two slabs, this was to arrive at the limit of the system; and this was what they tried, often with success, at the beginning of the Renaissance, whether in religious monuments, or in civil architecture."

It is interesting to observe also that Viollet-le-Duc, so far from adopting in any way the absurd paradox subsequently put forth by M. Corroyer,* that the intersecting vault was derived from the pendentive and from the domical forms of Aquitaine, strongly emphasises the exactly contrary view, that the apparent but non-structural ribs put on the face of the pendentives in some of the churches of Aquitaine were really a first concession on the part of the domical builders to the influence of the cross-vault form; the rib was put there because the employment of intersecting vaults had already developed such a taste for that division of roofing surfaces by moulded ribs. It is instructive to compare his analysis of this incident in the style (page 151) with that of M. Corroyer. At the same time, we cannot follow Viollet-le-Duc in his idea that the Early English vault was more essentially domical than the Early French one, because the sex-partite form of vault with us shows an additional rib between the springings of the diagonal ribs. His conclusion from this is that the Early English vaulting compartment is essentially a domical compartment intersected by pointed arches. There does not appear to us to be any foundation at all for this comparative criticism, and a further study of English architecture would have shown him that the sex-partite form is by no means so common a characteristic in England as he supposed.

In attempting to give a logical constructional reason for every device in Gothic building Viollet-le-Duc sometimes goes too far. We certainly think he does so in his remarks on the treatment of the wall-buttresses beneath the flying buttresses at

* Rational building; being a translation of the article "Construction" in the "Dictionnaire Raisonné de l'Architecture Française" of M. Eugène-Emmanuel Viollet-le-Duc. By George Martin Huss, architect; Member of the Architectural League of New York. London and New York: Macmillan & Co. 1895.

* See *Builder* of January 21, 1893.

Beauvais, illustrated on page 238, and commented on in the following page. These, it may be remembered, instead of being built solid, are composed of thin shafts and canopies, with figures between the shafts. He says, "the intention was to obtain at the height of the piers of the choir* and under the flying buttresses supports not solid, though perfectly rigid, in order, first, to load the lower piers as little as possible; and secondly, to make the settling of the inner parts, built in courses and stiffened by the pillars set against stratum, naturally carry the weights inward." The argument, which can hardly be understood, perhaps, except in connexion with the illustration, seems to be refining a little too much. The lessening of weight is something, no doubt, but if that were the constructional object, it seems to be the only reasonable one which can be adduced. He surely cannot mean that, in the event of a settling of the wall, these thin shafts were to act as *fulcra* on which to turn the weight of the flying buttresses inward rather than outward. The only result of that must have been to have cracked them. The lightening of weight might be one object, but we believe that lightness and richness of decoration was at least as important an aim. The author seems to have discovered a little more here than the structure will bear.

The portion of the book which contains less that is familiar to architectural readers is that concerned with secular buildings and their construction. Of course the constructive problem here is much less exacting; and one result of this is described in a rather paradoxical, though striking, sentence. While the church architects, it is observed, seeking to avoid solids and diminish points of support, "at last reached the point of totally suppressing walls in rearing their grand religious edifices, on the other hand in civil architecture they augmented the thickness of the walls in proportion as prosperous conditions obtained, which created a demand for more comfortable, stronger, and healthier houses." To what limit of date does Viollet-le-Duc mean this observation to apply? In England at least, taking the course of castle-building generally, it certainly does not seem to be in accordance with observed facts. It would rather seem that, back to Norman times, the older the structure the thicker the walls. This seems rather an outcome of the desire to put picturesque and striking contrasts, which is one of Viollet-le-Duc's weaknesses, and betrays him sometimes away from plain fact. But many of the remarks on Mediæval secular structures are of interest to all architectural readers, as they do not deal with theories now so well understood and admitted as the portion relating to purely ecclesiastical architecture, which after all is Gothic architecture *par excellence*.

Some of the remarks on questions of stability in Gothic buildings, and the means taken to ensure it, are well worth the attention of the student, as suggestions of first principles in building. Whether they are all to be legitimately derived from the example and practice of the Mediæval builders may be another question. We remember the piers of Peterborough Tower, and the frequent deficiency of adequate foundations in great Mediæval buildings, and doubt if the Mediæval builders were really as scientifically minded as Viollet-le-Duc makes them out to be. Nothing is simpler in appearance, he says, than the enormous façade of Nôtre Dame at Paris, and this is one of its excellences. "In seeing such a mass, one does not suppose that it is necessary to employ certain artifices, studied contrivances, for giving it perfect stability. It seems enough to have piled up courses of stone from the base to the summit, and as if that enormous mass ought to maintain itself with its own weight. But to build a façade 20 mètres high and to build one 69 mètres high are two different operations; and the façade of 20 mètres, perfectly solid and well combined, might not, if its dimensions were tripled in every way, be able to stand upright." He goes on to observe that while a pier of one square mètre in horizontal section and ten mètres high, gives ten cube mètres resting on a surface one mètre square, if we double both dimensions we have a bearing surface of four square mètres supporting a solid of eighty cubic mètres, although of just the same proportions as to height and width. But we doubt if Mediæval builders kept that truth intellectually before them. Had they done so, they would have taken more trouble with the foundations of their great buildings than they often did.

The term "rational" certainly applies to Viollet-le-Duc's treatise in so far as every conclusion in it is reasoned out. "Every man can express his opinion on a work of art," observes the author, "by saying 'This pleases me,' or 'This does not please me,' but no one is permitted to judge a product of the reason otherwise than by reasoning." That truth is at the bottom of the whole of criticism about architecture, which, both in regard to construction and design, is an art based on reasoning. But that does not justify the application of the term "rational architecture" as a title of the treatise. Greek architecture is quite as rational as Gothic; perhaps in its smaller details rather more so.

The translation is fairly done, but not always into the best English, though it may be, for all we know, the best American. The essay forms, however, as we have said, an admirable analysis of Gothic architecture for young students, and they, both English and Americans, may be grateful to the translator for bringing it more easily within their reach.

* This is a very clumsy translation of "au droit des piles du chœur." The words mean "in the vertical line of the choir piers."

THE LATEST DISCOVERIES AT SILCHESTER.

THE results of the fifth year's work of excavations on the site of the ancient Roman City of Silchester, are now on view at the Society of Antiquaries' rooms. As in former years, the Society has thrown its rooms open to the public, and free entrance is accorded to all who may care to inspect the objects that have been discovered.

Silchester, as our readers know, is a large area of ground now all but entirely used for agricultural purposes, enclosed by the massive walls of Roman times. The old parish church and a farm-house are the only buildings within the walls, and the traveller might very readily follow the public roadway across the area without being aware of the site ever having been once that of a densely-populated and important city. The course of the ancient streets has been known for many years, since at harvest-time the corn showed a difference of colour sufficiently defined to indicate their direction at right-angles one to the other.

The site of the Forum was excavated many years ago, and fragments of Corinthian capitals and of their bases of large size were discovered, together with many other objects of unusual interest. In more recent years the Society of Antiquaries has, with admirable public spirit, devoted itself to a systematic exploration of the site, and year by year a certain portion, bounded by the courses of the ancient streets, has been thoroughly dug over. These *insulæ* have already yielded important results, for not only have the sites of two quadrangular temples been found close to the parish church, but a great number of private houses of varying capacity have been excavated, and their ground-plans recovered. These show many interesting details of planning and construction, of special interest, since in no other site in England has investigation been made with any system on the site of a city. Roman villas in abundance have been investigated, but only here have town houses been laid open for observation. Year by year the results of the excavations have been recorded in these pages, and of special interest was the record of the discovery of what is believed, with every probability, to be the site of a Roman Christian church.

The past year's work has consisted of the excavation of four blocks or *insulæ*, each bounded and defined, as was the case of the blocks investigated in previous years, by the courses of the ancient streets. These blocks are known as Nos. IX., X., XI., and XII. The whole are close to the city wall, which here forms a well-defined angle to the course of the streets, the position being to the north-west of the Forum, the latter defining the centre of the city.

Blocks X., XI., and XII. form a triangle, having the base formed by the course of a street going east and west, the second side being another street going north and south, while the inclined side is formed by the city wall. Block IX. extends to the east of the triangle. The blocks, except XII., are crossed diagonally by the modern public road which goes through the city.

No large or important building has been discovered, with the exception of the foundations of a good house, which has apparently had an open corridor on each side of the dwelling-rooms; only another building, close to it, has been met with which may be considered to have been of domestic character. These two agree fairly well with the houses which have been opened out elsewhere during the excavations of the previous years. All the other buildings now found are of different character, and different also to any that have been discovered in the other cities. They are evidently for manufacturing purposes. They have no good floors, and no signs of fresco-painting have been found in any of them. But a good many curious furnaces have been met with of moderate size, built of rough material, and showing signs of continuous use. They are of two forms, circular and oblong, and they occur in positions very different one from the other, some being found within buildings; many in the open air, clear of all walls. They vary considerably in size, and although none were found in previous years elsewhere, at least twelve have been laid open, and of hearths only, as many as twenty-one, of which twelve are of circular form.

These furnaces, found as they are so close together, show that they were all devoted to the same purpose, and the supposition is supported in the room by the exhibition of a plan of one of the houses at Pompeii, where similar furnaces of later date than the house were found, and which were evidently used for dyeing purposes.

That a dyeing industry was practised at Silchester hardly admits of a doubt, for apart from the curious furnaces referred to, there have been found several wells, and, in addition, a goodly collection of querns, with which the madder roots for the dyes would have been ground. Elsewhere, notably in Block XII., rooms with underground flues, as if for drying purposes, after the process of dyeing, have been excavated.

All the discoveries that have been made have been laid down to scale on a large plan of the city, which is exhibited, and the results of the last year's work may be briefly stated.

In Block IX. four various buildings have been found, they have opened at once from the main street since their walls come up closely to its line. In like manner, the return streets bounding this block have the buildings close up to them without any intervening fore-courts. In the rear, at some distance from the front road, are the two houses already referred to.

Five buildings fill up the frontage of Block X., while a sixth is beyond them, the rest of the site having been vacant.

Block, or "Insula" XI., which comes close up to the city wall, has six buildings of the same character as the others.

Block XII. has two small quadrangular buildings, one of which has two diagonal

flues crossing each other from the angles, probably used for drying purposes.

In addition to the furnaces and the wells, the area excavated was found to contain a large number of pits, probably old cesspools. These have also been met with pretty generally wherever the ground elsewhere was opened. Many articles of pottery, not, however, of the very best form or manufacture, were found in these, the principal of which are exhibited.

While the buildings here, as well as elsewhere, are mostly set out with careful regard to regularity, and with their lines all at right-angles to the streets and to each other, there are some variations. Thus in Block IX one of the four buildings, although it comes quite up to, and its frontage is defined by, the line of the street, is not at right-angles to it, which is the more noticeable since the buildings on each side of it are rectangular to the frontage. The dwelling-houses in the rear are still more inclined, although at right-angles to each other. While the great plan shows all in the city, so far, to be set out so regularly, it is curious to see so complete a change of system in these groups of buildings. Possibly they may be of older date than the setting-out of the streets.

Very little of architectural detail has been found; the principal object is a well-moulded capital, with a plain necking, which has been turned in a lathe. A base was also met with, evidently belonging to the same or a similar column. It has two toruses very close to each other, and, like the capital, turned. The material is not unlike a coarse Bath stone, probably oolite, from Gloucestershire. Both had been re-used as old material.

A fine slab of even-tinted Purbeck marble was also met with, although nothing was found to indicate what position it had occupied. There are clamp holes at its edges, and since it had been polished only on one face, it would appear that it had been used as a wall lining. But its great thickness almost forbids this supposition. It has been again polished, and the fine grain of the material is shown in consequence to great advantage. The most curious object that has been discovered is a cone of solid stone, about 2 ft. in height, which has had a neatly-worked base, circular, terminating in a square. The form appears Phallic, and it is remarkable for having an Ogam inscription.

Various cases contain the principal small objects found. These consist of bronze personal objects, and articles of toilette, one of which is inlaid with silver. There are also several bone pins, one of jet, a single pretty piece of bronze enamelled in a Celtic-like pattern, a few pieces of window-glass, and of glass vessels, one of which has part of a pattern produced by grinding, an engraved gem, a gold ring of elaborate pattern, a bronze hinge pierced with an open-work pattern of much beauty. Special interest attaches to a hoard of silver coins which were found in a black vase. These extend from Mark Antony to the Emperor Severus. They include a large number of the intervening Emperors and Empresses, and afford interesting evidence of the length of time in which Roman coins were kept in circulation, for it is evident that the early ones, as well as those of later date, were all current money at the time when they were hidden for security.

A bronze purse, to be worn on the arm, unfortunately empty, is one of the most curious of the small articles. There are exhibited several pieces of coloured wall plaster, decorated with patterns and various tints, but no examples of figured tesselated pavements have been found this year. Indeed, beyond one or two rooms paved with ordinary red tesseræ, no floors except of very ordinary description, composed of fragments of brick worked up in cement, have been found. But that some pavements of rather better description did exist is shown by the presence of several octagonal paving tiles, exceedingly like those of modern make. But there are no specimens of the small square tiles that were necessary to fill in the inter-sections.

The large map is a very useful and important feature of the exhibition, for it brings before the spectator the general results of all the previous excavations, and it indicates the large amount of area within the walls that has yet to be laid open. So far about forty only of the 100 acres have been made to reveal the secrets of the long-buried past, and then filled in again for agricultural purposes. It is matter for regret that funds have not been subscribed so promptly as the importance of the work appears to justify, and we are sorry to see that a balance, although a small one, is due to the Treasurer. It is much to be hoped that a work so important as this is may be carried on more rapidly during future years, and that the whole area may be investigated within a reasonable period of time.

NOTES.

THE Government inquiry into the alleged insufficient water supply of the Southwark and Vauxhall Water Company during the late frost has revealed an enormous amount of public inconvenience during the late hard weather, and a deficiency in the water supply which is probably unexampled in any other large city in the world. It has shown also the very strong public feeling on the subject, since witness after witness has come forward to detail the story of his domestic troubles. The ordinary average citizen does not attend inquiries of his own free will unless he is strongly moved. One witness stated that he had been without water from January 30 to April 13, and many other witnesses had very similar evidence to give. Whatever may be the report of the Government official, it is obvious that the public uprising against the water companies will have some practical results. One of these appears to be the establishing of a Government examination of the water-mains. This would be a perfectly reasonable measure; it would be analogous to the inspection of the permanent way of railway companies, and whether the water-supply remains in the hands of private companies, or is transferred to a public body, such examination is necessary in the interests of the general body of water consumers. Another point which is equally clear is that there must be a standard minimum depth fixed, above which water-mains are not to be laid. If this had been settled years ago an immense amount of public inconvenience would have been saved, since it must be borne in mind that though during the past winter the water famine has been more general than hitherto has been the case, yet that a winter rarely passes without some stoppage of the water supply in various parts of London and the suburbs.

THE Urban District Council for Wimbledon have circulated a Report on the failure of the water supply in their district, by Mr. C. H. Cooper, A.M.I.C.E. The total length of miles of main frozen in the district was 15·4 miles, of which 8·5 belonged to the Southwark and Vauxhall Water Company, and 6·9 to the Lambeth Company. Mr. Cooper reports that had the Water Companies insisted on the contractors carrying out the instructions in the Companies' own specifications to lay all pipes with at least 2·6 covering, very few mains would have been frozen during the late frost, though the frost had in some places penetrated to a depth of 3 ft. It was found, however, that the depth of the mains varied from 1 ft. 4 in. to 2 ft. 3 in. below the surface; and in no case was a main found with 2 ft. 6 in. covering. A small main in High-street, Merton, was found frozen at a depth of 3 ft. 4 in. below the surface, but on either side of this point the main rose to within one foot of the surface. Mr. Cooper is of opinion that under roads and in clay soil, 4 ft. of covering at least should be provided over the mains. The same report states that the metal used in the recently-laid mains is very inferior to that of the older mains, and often much too thin—barely a ¼ in. thick in one instance mentioned, of which a sample was sent in with the Report.

THE announcement of an International Sanitary Exhibition to be held in Paris this summer from June 1 to September 15, ought to be a matter of considerable interest to English sanitary engineers and manufacturers. In accordance with a law recently passed the whole of the house drainage of Paris will have to be re-arranged in the course of the next three years, and it is no secret that English sanitary arrangements form to a considerable extent the model before the eyes of sanitary reformers in Paris. In regard to sanitary science and sanitary appliances the French have recognised lately that we are far ahead of them; so much so that some large hotels in Paris advertise among their advantages the possession of sanitary fittings by English firms; promises which are unfortunately not always realised. But there can be little doubt that any English exhibits at the forthcoming exhibition will receive a great deal of attention, and this is an opportunity which English sanitary specialists should make the most of. The Special Commissioner for the English section of the exhibition is M. Maurice Pérès, 103, Boulevard Haussmann, to whom all enquiries can be addressed. The exhibition will be held in the Palais des Arts Libéraux on the Champ de Mars.

AS a result of the Conference held some months ago on the adulteration of Portland cement, the cement section of the London Chamber of Commerce is pursuing "an inquiry as to the effects of the alleged adulteration of cement with Kentish rag." The inquiry is apparently to be confined to a consideration of Kentish rag alone, and Messrs. Knight, Bevan, and Sturge have some reason for declining to subscribe to the expenses of the inquiry, until they know whether the admixture of gypsum and other substances is to be considered. An authoritative pronouncement on the effects of Kentish rag on Portland cement will, however, be better than no inquiry at all.

FROM the sixth annual report of the Highways and General Purposes Committee of the Gloucestershire County Council we are glad to find that the Council are attending to the important duty of erecting guide-posts, or, as they call them, "direction-posts." About 150 of these have been already fixed. The Committee have adopted an oak post with a cast-iron removable head and arms. This has been designed by the County Surveyor, and provides a durable and useful direction-post at the low cost of 17s. each. It is to be hoped that the Council will thoroughly carry out this useful work over the whole of their district, and that their example may prove an incentive to the authorities of some other counties, where this information to travellers is almost entirely wanting, to follow their example.

AFTER a disappearance of some months, for reasons unknown to us, our old French contemporary the *Semaine des Constructeurs* has suddenly re-appeared in a green wrapper and with the title of *La Semaine du Bâtiment;* in other respects it seems to be practically the same paper as before, under the conduct of the same editor, M. Marcel Daly, who was nominally the assistant-editor but in latter years really the acting-editor of the *Semaine des Constructeurs.* With his name is associated that of his brother, M. Raymond Daly, who is a lawyer *(Avocat),* and edits the portion of the paper devoted to jurisprudence. The *Semaine du Bâtiment* will evidently be, like its predecessor, an exceedingly practical paper, and one which may be relied upon for giving correct information on the subjects

treated in its columns, though it does not deal much with the picturesque and artistic side of architecture. The late M. Daly's larger and more important paper, the *Revue Générale*, we fear is to be regarded as defunct.

WE are glad to hear that it is proposed to institute a Professorship of Architecture in connexion with the "Glasgow and West of Scotland Technical College." Mr. Charles Gourlay, A.R.I.B.A., has for some time past been giving lectures on Architecture and Building Construction at the college referred to, and as the usefulness and interest of these has been practically demonstrated, the Governors have determined to increase the importance of this department of the college training by creating a Chair of Architecture and Building Construction. Mr. Gourlay, who has undertaken to devote his whole time to the duties of the office, has been recommended as the first holder of the Professorship.

THE last International Exhibition heard of is the one to be held next year at Mexico. It is provided already with a special journal to advocate its interests. *The Mexican Exposition*, of which the first number has reached us. This contains sketches of some of the intended buildings; which, however, will be of a very gewgaw description, so far as one can judge by these illustrations.

IT was expected that something quite exceptionally good in the way of electric lighting would be done by the Edinburgh Corporation. It is now over four years since they got their Provisional Order sanctioning them to set up a public installation, and it was only after an exhaustive study of the methods adopted in every important city that they decided on one combining the advantages of low tension direct for consumers near the station and high tension alternating for those at a distance. Naturally they chose Professor Kennedy as their consulting engineer, as, apart from his skill and experience, he is an Edinburgh man, and, therefore, likely to appreciate local prejudices. The only contracts that have not gone to English firms are those for the buildings, boilers, ironwork, piping, and arc-lamp-posts. In the station itself there are several novelties. Electric motors drive the feed-pumps, replacing the donkey-pumps which are ordinarily used to feed the boilers with water. They are also used to drive the mechanical stokers. We notice that Messrs. S. Z. de Ferranti are going to supply rectifiers for the arc-lighting on the alternating current circuit. Their success at Portsmouth has proved that this novel and ingenious method of lighting has got out of the experimental stage. The advantage of rectified current over alternating current in arc-lighting is that the top carbon is hollowed out, so that most of the light is thrown downwards instead of illuminating equally up and down. The lighting of Princes-street from end to end by arc-lamps is a conspicuous success, and it is now one of the best lighted—if not the best lighted—street in the country. The arc-lamps are suspended from ornamental brackets on standards at a height of 23 ft. They are placed 50 yards apart from one another, and are nominally of 3,000-candle power each, taking 15 ampères. They are all on the north side of the street, but, notwithstanding this, the south side is still better lit than it was formerly by the gas-lamps. On the north side there is, of course, a brilliant illumination, which has the effect of throwing the gardens beyond the south side into a very deep shade. This increase in the lighting of the street is not got without increased expense. Formerly, when the street was lit by gas, the annual bill was 400*l.*; now it will be 620*l.* The Corporation have spent 120,000*l.* of the ratepayers' money on electric lighting, but it is a very promising investment, as is shown by the fact that no less than six separate companies tried to get provisional orders before the Corporation decided to apply themselves. Professor Kennedy has not only made the enterprise successful from an engineering point of view, but has specially studied the financial side of the question. The only little hitch that occurred was in connexion with lifting the roadways to lay the cables, the cellars of the shopkeepers being found in most unexpected places, and the owners most strongly objecting to them being interfered with. The price the Corporation is charging now is 6d. per unit. That this price will be reduced seems probable, as Edinburgh offers every advantage for successful electric lighting, being compact, and having shops, offices, and houses all close together.

A PAPER was read before the Society of Arts on Tuesday last by Mr. W. Gowland (late of the Imperial Japanese Mint), on "The Art of Casting Bronze in Japan." Numerous specimens were exhibited in the room to illustrate the subject. The following were among the points mentioned in the lecture. Mr. Gowland regards the history of Japanese bronze work as modern in comparison with much Asiatic bronze work. Japanese bronze casting could not be traced further back than the seventh or eighth centuries B.C. With the introduction of Buddhism, about 552 A.D., as the national religion of the country came the demand for colossal figures, bells, and other temple ornaments. The earliest dated example was, perhaps, a spherical box of gilt bronze found in a sarcophagus at Ten-o-ji, bearing date 705 A.D. Mr. Gowland claims this to be the earliest known bronze. Of colossal images, the largest is the image of Nara Daibutsu, in the Temple of Todaigi. It was not cast as a whole, but in comparatively small pieces, united by running in an alloy of tin and lead between the edges. The colossal and magnificent image of Daibutsu of Kamakura—the *chef-d'œuvre* of Japanese bronze casting—is smaller than the Nara Daibutsu; it was also cast in numerous pieces, but in this case they were joined by "burning together" with bronze. Feudalism was established throughout Japan in the seventeenth century, and to its influence is traceable the rapid development in Japanese bronze casting during that period. A section of the great bell cast for the Temple of Rochana in Kyoto, was shown by the lecturer as among the remarkable castings of this period. The bell is 14 ft. high, 9 ft. in diameter at the mouth, and 10¾ in. thickness of metal at the rim. Like all Japanese bells the rim is thickened internally, resulting in a constriction at the mouth, and productive of that gentle rising and falling characteristic of the boom of all the temple bells. Among numerous specimens of the work of this epoch of revival are the beautiful bronze gates to the tomb of Iyeyasu at Nikkò. Among modern Japanese bronze workers the first place may be given to Suzuki Chokichi, who, although a naturalist, is free from the vulgarity which unfortunately characterises most modern Japanese bronze-work. This is manufactured usually for the European market; what the Japanese make for themselves is still excellent in design, and in accordance with the time-honoured traditions of the country. The patronage of the Emperor is beneficially directed towards encouraging greater excellence in bronze-casting, and the modern bronzes cast for the Imperial Palace equal, in design and execution, the works of the old masters. In the preparation of the mould and core, the Japanese use vegetable wax, bees'-wax, resin, and to a greater extent than either, chopped rice-straw—where great delicacy of line is required bees'-wax and resin were employed. Ingates for pouring in the metal are not only placed at the top of the mould but in one or two tiers at the sides. After the wax model has been coated with thin clay, the mould is slowly dried, the wax melted out, and the mould hardened by means of a charcoal fire. The typical Japanese furnace was highly commended, and has the advantage of being easily transportable—indeed, the entire paraphernalia of the Japanese worker in bronze can be removed and fitted up in the temple garden, palace, or wherever else the bronze has to be placed.

NEVER before, we should think, has so great a number, amounting to many thousands, of interesting engraved wood blocks been offered for sale, as those which were dispersed at Sotheby's auction-rooms last week. The various lots, realising, with but few exceptions, ridiculously low prices, comprised Mr. Edwin Pearson's unrivalled collection, together with quaint and curious examples from old English printing-offices, and the ancient stock of John White, King's Printer for the five Northern Counties; blocks used in the earliest editions of the "Pilgrim's Progress," "Emblems," "Robinson Crusoe," "Philip Quarle," Henry VIII.'s Great Bible, and so on; and blocks designed and engraved by Thomas and John Bewick for the Newcastle printers. Much of T. Bewick's most beautiful and characteristic work is to be found in his vignettes, tail-pieces, sylvan scenes, and his anglers' and fishers' "garlands." Into these he often introduces local buildings, such as Tynemouth Priory, the towers of Durham Cathedral, the steeple and lantern turret of St. Nicholas, Newcastle-on-Tyne. The "Select Fables," with oval cuts by the two brothers, unaided by pupils, was first published, in three parts, by T. Saint, at Newcastle, in 1784; it was reprinted there (in Bewick's life-time) in 1820, by Emerson Charnley, who substituted brass plates for the woodcut borders, many of the latter having been injured in the interval. Subsequent editions were brought out by the late H. G. Bohn (*circa* 1854), Longmans (1878), and Ballantyne—the édition de luxe (1879). This set of blocks, "with copyright," a set of the "Tommy Trip" series, and a large stock of similar material, were bought for fifteen guineas. Mr. Pearson's collection of 2,300 blocks, engraved by the Bewicks, without pupils, for Saint, to illustrate a variety of children's books, which, with the children themselves, have quite gone out of fashion, sold for nine pounds. In the earlier portion of the period covered by these, John Newbery had begun to issue his little picture-books "for little masters and misses"; some of them written for him by Oliver Goldsmith, and their "pictures" engraved by "J. B." (John Bell). Bell's blocks, with those of T. Bewick, for, respectively, the Salisbury and Newcastle editions of "Tommy Trip, Giant Woglog, and Dog Jowler," and those of "Goody Two Shoes" (London and Newcastle), were included in this remarkable sale, as also T. Bewick's "Hermit of Warkworth," and his geometrical figures for Hutton's book upon mensuration (1770); with several blocks by Seymour, George and Robert Cruikshank, Luke Clennell and Lee, pupils of Bewick, and other celebrated draughtsmen. The illustrated catalogue, by Mr. Pearson, should take its place in the bibliography of the history of English wood-engraving.

THE loan exhibition at the Guildhall is one of the most interesting which has been seen there. Among the prominent pictures which first became known from ten to twenty years ago, and which it is very interesting to meet with again, are Mr. Poynter's "The Catapult," Landseer's "Swannery invaded by Sea Eagles," Sir John Millais' "Rosalind and Celia" and his "Over the Hills" (which latter more than justifies the admiration it excited at its first exhibition), Mr. Leslie's "School Re-visited," Gerôme's "Bain Maure" and "An Eastern Girl" (the latter we remember as one of the most brilliant things in Wallis's Gallery many years ago, when its contents were more brilliant than they usually are now), Mr.

Tadema's "Pyrrhic Dance," Phillip's "La Gloria," Fred Walker's beautiful little work, "Mushroom Gatherers," a small picture of Mason's, &c. Among the more recent works are Sir F. Leighton's "Hesperides" and Mr. Lavery's "Ariadne." Mr. Frith's "Claude Duval" and O'Neil's "Eastward Ho!" carry one back to earlier days and simpler theories of art. Neither painting will have many admirers now, in point of style and colour; but O'Neil has the merit of having treated a subject of deep popular interest at the time with real feeling and a good deal of dramatic effect. The exhibition includes also some goldsmiths' work lent by Sir J. C. Robinson, a case of Tanagra figurines and bits of antique bronze, and a good many other objects of decorative art to which we may return. It is an excellent move on the part of the Corporation to extend the loan exhibition to objects of this class, so as to give the class of persons who most frequent a free exhibition the opportunity, at least, of learning that art is something else besides "pictures." It is true that the cases of cameos and jewellery seem to excite little attention among the crowd at present, and all eyes seem rivetted on the pictures; but in time it may be discovered that there is some interest in the contents of the former; and at all events, it is giving the multitude a chance.

THE Society of Water-colours' Exhibition contains enough admirable works to make a most interesting exhibition, notwithstanding that one or two of the most able members are either absent or have not contributed very important works. Mr. Alfred Hunt's "Holy Island" (23) is a small and very interesting study in atmospheric effect, but hardly a picture. Mr. Hunt has for the first time (as far as we have noticed) been treating architectural subjects, in the shape of two studies of the Parthenon (97, 194); these are essentially landscape painters' studies, and the columns are not in all cases correctly drawn, the diminution at the necking being much exaggerated. The exhibition shows a considerable tendency towards the study of special effects of light. Among the best of these are Mr. Albert Goodwin's "Summer Night, Florence" (61), and Mr. Cuthbert Rigby's "Winter Night" (85); Mr. Eyre Walker's "Autumn Twilight" (60) is rather too misty in effect and execution; and something of the same manner seems to show in his larger work "Russet Woodlands" (114). Mr. Walker's previous style was broader and more powerful. Professor Herkomer contributes a large and fine drawing called "The Golden Hill" (29), described as "A Souvenir of J. W. North"; a fine landscape, presented in tones and method of execution recalling Mr. North's manner, but with the addition of three bathing goddesses or nymphs in the foreground, who assimilate very well with the dreamlike character of the landscape. Among drawings in which, as Constable put it, "God's daylight is preserved," are Mr. Cuthbert Rigby's "Spring" (26); all of Mr. R. W. Allan's, who never fails to realise light and colour (see especially No. 131); and Sir F. Powell's "Springtime in the Flat Lands of Essex" (110). Mr. Arthur Melville's "Venice" (70) is an interesting study of colour and effect. Among figure-subjects Mr. E. R. Hughes, who at the last exhibition attracted much attention by his rather repellant subject of the girl and snake from the "Nights of Straparola," has gone to the same book for the subject of "Bertuccio's Bride" (59), an elaborate and finely-executed work, but not interesting. Mr. Bulleid is quite at his best in his "Tanagra Image-seller" (1), where a beautiful Greek girl comes down marble steps to bargain with a child selling the terra-cotta statuettes which have once again become so familiar to the modern world. Mr. Tom Lloyd, in such works as "In the Rosy Light" (30), appears to us to be pushing a special effect of sunset light too far for Nature; it appears in more than one of his drawings, and though beautiful in a sense, looks somewhat artificial. Among drawings in which architecture is prominent may be mentioned Mr. A. Goodwin's "Lincoln" (15); Mr. Rooke's "Spires of Chartres" (72), a fine and carefully-studied view of the cathedral towers from a street in the town; Mr. G. Fripp's "Keep of Kenilworth Castle" (90); Mr. Collingwood's "In St. Mark's, Venice" (143); and two scenes in Hoorn from almost exactly the same point of view, by Mr. S. J. Hodson (101) and Mr. R. W. Allan (121); it is rather interesting to compare the two, and to see what a different appearance the same architecture assumes in the hands of two artists whose aims are quite different; one of them studying detail, the other looking mainly to effect.

ANOTHER set of Mr. Marks's bird studies is on view at the Society of Fine-Arts. They resemble the last exhibition pretty much in all their excellences—one cannot add "and defects" because there are no defects, except the general one of a certain degree of monotony inseparable from the repetition of bird studies pure and simple, not pictures with birds in them, which is another matter. Two or three of the best of the artist's oil-paintings of the superior bipeds are introduced, to give a little more point to the exhibition; among others "The Great Auk's Egg," one of the painter's most perfect studies of character, which it is pleasant to see again.

THE collection of paintings of the early British School at Messrs. Dowdeswell's gallery is of more interest than dealers' collections of this kind usually are. It includes more examples than one generally sees together of the landscapes of Barker; a fine portrait by Hoppner, another fine one by the almost unknown painter Kettle; two or three fine works by Cotman, some small pictures and sketches by Constable, some of them of unusual interest, and a beautiful landscape "Near Cromer," by Stark, remarkable for its combination of artistic quality with topographical accuracy.

THOSE of our London readers who care for what is beautiful in nature and art alike should not omit to look at the fascinating display of hyacinths, tulips, and daffodils in the range of flower-beds in Hyde Park, flanking the line of Park-lane. The range of colour in the hyacinths, from white to the dark purple of the "General Havelock" (which looks almost black when seen *en masse* at a distance), is most remarkable; each colour is grouped in one bed, alternating occasionally with a phalanx of golden-globed tulips, or delicate pale yellow daffodils which bow to each other as the breeze moves over them. One bed of daffodils is combined with a small delicate blue flower of lower stature, so that the daffodils seem to rise out of a sea of blue. These flowers, as every one knows, are as evanescent as they are lovely, and it is a pity the show attracts so little notice; people rush about to picture-galleries, and neglect a sight which has been said on the highest authority to be better than that of Solomon in all his glory, and which, according to our greatest English philosopher, affords "the purest of human pleasures."

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the Royal Institute of British Architects took place on Monday last at 9, Conduit-street, Mr. F. C. Penrose, M.A. (President), in the chair.

The Secretary (Mr. W. H. White) announced the decease of Mr. John George Hall, elected an Associate in 1875; of Mr. Gordon Macdonald Hills, elected an Associate in 1858; and of Mr. Alfred Hayles Clarke, elected an Associate in 1892.

The President said that ninety-five persons were admitted to the Final Examination, qualifying for candidature as Associate, held from the 29th ult. to the 5th inst., and that eighty-six of these attended and were examined. This number included seventy-five who had been relegated from previous examinations, five students, and six practising architects and chief assistants. The Examination was conducted simultaneously in London and Manchester. The following are the twenty-six who have passed, and are qualified for candidature as Associate:—Harry Allberry, London; Robert Saxton Besant, London; Edward George Collins, London; George Cowan, Southsea; Stanley William Worth Delves, Tunbridge Wells; Alfred John Dunn, Edgbaston, Birmingham; Edward Greenop, London; Charles James Hair, Twickenham; James Guthrie Henderson, London; Harry Hutt, Reading; Percy Leeds, London; James Alfred Ernest Lofthouse, Middlesbrough; Charles Kay Mayor, Fallowfield, Manchester; Robert Messenger, London; Orlando Middleton, Cheltenham; Francis Edward Morris, Reading; Frank Peck, London; Edward Penfold, Reigate; Frederick William Petter, Barnstaple; George John Thrift Reavell, London; Cecil Alexander Sharp, Banstead; James Hewitson Shaw, Walthamstow; Christopher Mitchell Shiner, London; Herbert Story, Birkenhead; Harry Garnham Watkins, Lincoln; William Charles Waymouth, London.

The President further announced that at the Preliminary Examination held in London, Bristol, and Manchester, on the 19th and 20th ult., 55 applicants had been exempted from attending; and out of the 83 examined, 59 passed, 22 were relegated to their studies, and 2 failed to pass. The total number examined in London was 47, of whom 32 passed; in Bristol 8, all of whom passed; and in Manchester 28, of whom 19 passed. The names of the 114 newly-registered Probationers are as follows:—Francis Henry Allen, Kettering; George Anderson, Aberdeen; Henry Milnthorpe Appleyard, Liverpool; Herbert Weston Ayles, Weymouth; William Baillie, Glasgow; William John Ball, Warrington; Percy Montagu Beesley, Warrington; Arthur Edward Bell, Lincoln; Alfred Ernest Biggs, London; Lennox Godfrey Bird, London; John Silvester Blunt, Peterborough; John Percival Bridgwater, Saltley, Birmingham; Guy Alexander Brown, Liverpool; Herbert Elisha Brown, Oxton, Birkenhead; John Brown, Leicester; Robert Hepburn Butterworth, B.A.Cantab., London; Walter Cecil Butterworth, London; James Carter, Windermere; John Boswell Chapman, Englefield Green, Surrey; John Henwood Chorlton, Sheffield; Harold Robert Clayton, Canterbury; Tilleard Horace Osman Collings, Petersfield, Hants; Charles Heaton Fitzwilliam Comyn, Folkestone; Henry Fothergill Cooke, Hambrook, Bristol; Isaac Cooke, jun., Liscard, Cheshire; George Donaldson Copland, Glasgow; Harry Haighton Cork, Bacup; Grahame Cotman, London; James Dallas, Birmingham; Harold Henry Danby, Scarborough; Percy William Darbyshire, Knutsford, Cheshire; Charlie Davis, Swansea; Edgar Gustav Dickinson, Birkdale, Southport; William Driffield, Harrogate; Claud Germain Dunand, London; George Edwards, London; Walter Watkin Ellison, Wellingborough; William Ernest Emerson, London; Frank Quentery Farmer, Stalybridge; Frederick Victor Forrest, London; Frederic Douglas Fowler, Plymleigh, near Plymouth; James Ernest Frost, Bridgwater, Somerset; Hubert Ernest Gilford, Edwalton, near Nottingham; Thomas Sedgwick Gregson, Scarborough; Charlie Hale, Fairfield, Kettering; Charles Llewellyn Hall, Whalley, near Blackburn; James Mitchell Halley, Hillhead, Olasgow; James William Hayes, St. Leonards-on-Sea; Percival Joseph Haywood, London; Charles Simkins Heath, Bushey, Herts; John Stanley Heath, London; Frederick William Higginbotham, Clontarf, Co. Dublin; John Higson, Blackburn; Frederick Robert Hiorns, Devonport; Victor Tylston Hodgson, Harpenden, Herts; Arthur John Hope, Atherton; Charles Henry Isaacs, London; Norman Harold Jameson, Bolton; Henry Jardine, London; Reginald Herbert Jeffes, London; Rupert Jeffries, West Walsall; William Jenkins, Llandilo, South Wales; David Jones, Bettws-y-Coed; Edward Oliver Jones, Penrhyn Isa, Llandudno; John Ivor Price Jones, Cardiff; Frederick Henry Kimber, Newbury; Albert Edward Lacey, Bournemouth; Herbert Sleeman Lawson, Clifton, Bristol; James Constable Leed, London; Arthur William Lewis, Widnes; Charles Martell Lewis, Newport, Mon.; Robert Alexander Stewart Macalister, B.A.Cantab., London; Alfred Lightly MacGibbon, Edinburgh; Ernest William Marshall,

London; William Arthur Mellon, Edinburgh; Stanley Joseph Milner, Cardiff; James Millward, London; Reginald Morphew, Streatham; William Singleton Morton, Hendon; Francis Winton Newman, Parkstone, R.S.O., near Bournemouth; Henry Arthur Newman, Parkstone, R.S.O., near Bournemouth; Albert Edward Parry, London; William Frederick Peverill, London; Arthur Pickup, Blackburn; Arthur Robert Plowman, London; Percy Charles Poley, Hampton Hill, Middlesex; Walter John Prichard, Birmingham; Basil Procter, Newcastle-on-Tyne; John Rowland Roberts, Birmingham; Reuben Roberts, Chester; Thomas Henson Robinson, Crabtree, Pitsmoor, Sheffield; Ernest George Rodway, Weston-super-Mare; John Bedward Royle, Chester; Nathan Thomas Salmon, Reading; William Peel Schofield, Leeds; Thomas Faulkner Shepheard, Greenheys, Manchester; Ernest Edward Shepherd, Newcastle-on-Tyne; Peter Chalmers Smith, Aberdeen; Robert James Somerside, Glasgow; Charles Ernest Burgett Sutton, Great Sankey, near Warrington; Francis Edward Tabberer, Leicester; Henry Tanner, jun., Beckenham; William Todd, Hillhead, Glasgow; Walter Stephen Tucker, Glasgow; Arthur Bertie Venables, Chiswick; William Henry Watkins, St. George, Bristol; George Watson, Aberdeen; Frederick Christopher Wheeler, Horsham, Sussex; George Henry Widdows, York; Joseph Gilbert Wiles, Richmond, Surrey; Arthur Phillip Lomax Wood, Liverpool; Alfred Ernest Woodhouse, Windermere; Gordon Lorimer Wright, Kelvinside Glasgow; Clyde Francis Young, Putney.

Papers were then read by Professor Aitchison, A.R.A., and Mr. William Young, on "The Use and Abuse of Marble for Decorative Purposes":—

Professor Aitchison briefly touched upon the various kinds of stone classed as marble, and referred to the distinctive qualities and beauty of that material. The Greeks seemingly chose it mainly on account of the perfection to which it could be worked, and the delicate modelling it would express, and the Italians followed in their footsteps. Coloured and variegated marbles were in high favour among the Romans. Enormous quantities were used by them. The country-house of the Gordiani in one single portico had 200 columns, and in the same villa were three basilicas having 100 columns each. The greater part of the marbles used in the palaces, churches, &c., of the Dark Ages and Early Mediæval days were taken from the ancient Roman buildings. In modern times many of the quarries which supplied the ancients have been rediscovered, and new ones have been opened. The great drawback to the use of flowered marble for columns that bear weight was its liability to flaws and defects, and the shafts should first be tested by the hydraulic press. With regard to the internal use of marble in England, it looked and felt cold in winter, and when buildings were not warmed it condensed the damp. Marbles mainly formed of carbonate of lime were useless externally, as the polish rapidly perished. The use of marble for decoration was to colour harmoniously by means of a particularly beautiful and specially coloured material. The finer flowered sorts had in their colouring every sort of motive and caprice that could astonish and charm. The Professor then described the colours of different marbles, and referred to the imperishable coloured decorations to be obtained by inlaying. Monumental colour was as hard to get as monumental form. The safest course was to adhere to one colour, or to some strong contrast of two colours, such as black and white, dark purple and white, or dark green and white. Black and white for columns, balustrades, and walls had a dignified effect, but the white should greatly predominate, or the effect would be too funereal. If an effect of richness, magnificence, or gorgeousness, or of delicacy or loveliness, were required, the same rules held good in marble as in painting. For a white or light ground, with colour interspersed, the other colours should be very light, or bright colours in small pieces; while for a dark or low-toned ground, white or very light tones should be sparingly used. The Professor then laid down certain maxims as to the employment of flowered marbles, and recommended for study in the use of coloured marbles the Pantheon, St. Mark's at Venice, St. Sophia, and other buildings, describing the effects there obtained by different schemes of colour treatment. Such use of marble, however, should only be attempted by those who possessed the rare gift of being able to harmonise colours, and had perfected that gift by study, observation, and trial. The Professor concluded by referring to a "Vision of Paris," by M. Charles Garnier, and expressing the hope that it might be realised in London.

Mr. Wm. Young said that his remarks, based upon his own experience and observation as a working architect, would be confined to the use of marble in interiors. The employment of that material, which had been almost entirely absent in English architecture, had developed enormously in recent years; but the question presented itself, Did we always use it in the best way and in the right place? The true use of marble meant something more than merely lining walls with slabs of that material, set in courses marked off by horizontal and vertical joints after the manner of the marble wall papers, with which the walls of the passage and stairs of every ordinary house used to be covered. In marble as in other materials the architect should follow a certain order and scheme to bring out his design. The labour of the hewer, the sawyer, and the polisher revealed the beauties of marble; thought and skill must be added to make it beautiful in architecture. To explain his meaning the author referred to the arrangement of the marbles represented in Mr. Alma Tadema's picture "At the Shrine of Venus." For use in a large way marbles should be few, but well chosen. With three or four different marbles handled by a master there was nothing within the range of architectural art, from simplicity to magnificence, that the architect could not accomplish. In selecting marbles for columns, arches, &c., it was sometimes exceedingly difficult to get the particular type wanted to ensure perfect harmony. Instances within the author's own experience were cited. Columns should be constructive, and not planted on for decoration; if possible, they should be monoliths. Square pillars should be solid marble, and not brick cased with marble slabs jointed to imitate solid masonry. The marble on walls, where solid blocks would be useless waste, should be so treated as to show that it was a lining. Ordinary box-marble chimney-pieces, consisting of slabs of marble placed one in front and one on each side, as though to give the appearance of a solid block, the author considered not to be a true use of marble, and not architecture. With regard to the question, "Should Colour follow Form?" the author was of opinion that there was much sound truth in Mr. Ruskin's dictum that colour should be visibly independent of form, although in actual work it was found that colour, as a rule, must follow form. There were, however, exceptions. Instances and reasons in support of both views were shown and explained by the author by the aid of photographs of existing buildings, and the conclusion arrived at that a true and intelligent medium should be observed. The author next discussed the question *where* to use marble. If the *where* was wrong, the *how* could never be right. One thing was certain: marble had not been used in the present day where it ought to have been used. Largely employed in clubs and restaurants, in fish-shops and shop-fronts, in our churches marble was conspicuous by its absence. It would be well if modern architects would endeavour to see their work as their successors would see and criticise it with regard to the use of marble. A forecast of such criticism the author would try and put before them by imagining himself at a meeting of architects in the year 2395, to hear a lecture on "The Use, Non-use, and Abuse of Marble in the Architecture of England at the End of the Nineteenth Century," in which the hypothetical lecturer deals with the lavish use of marble in palaces, club-houses, mansions, halls of amusement, &c.; its abuse in drinking saloons, &c.; its non-use in Government buildings, where it would appear to have been prohibited by law; and—strange anomaly—its complete absence in the churches of the period, where only dingy brick and plaster were found, and sometimes a cheaper kind of stone sparingly used.

Mr. Young, at the close of his paper, exhibited several views of the Glasgow Municipal Buildings, by the limelight.

Mr. W. Brindley said that on being invited to join in the discussion, he had jotted down a few hasty notes. Professor Aitchison had remarked that polished white marble possessed a great charm, that one seemed to see into its substance. This seeing into the material was one of the most expressive remarks which could be made, and defined the white marbles used be the classic Greeks, the early Romans, and later by the Byzantines. But this definition rarely applied to the white marbles now commonly used, coming from Carrara, the bulk of the material being a bluish stone, and more or less opaque. Down to the fifteenth century, in Italy, they usually worked the surface with the chisel, sand-rubbing it up at the most. No doubt the Romans were right in making their coloured marble columns monoliths, the grandeur of the effect produced being worth the cost and trouble. Where the block varied in colour, the deeper shade had better be selected for the bottom. When columns had to be jointed, three stones were better than two for plain columns, but for reeded and fluted columns the joint should be made at the top of the reeds. There was much difference of opinion as to the joining of slabs to produce a pattern, either continuous or in panels. His opinion was that the practice was thoroughly legitimate, as it in no way represented a sham, and was the method used in Santa Sophia, and St. Mark's, also in San Vitale, Ravenna, which were among the best examples extant. In all cases, as few colours as possible should be used, and frequently pleasing results were to be obtained with the lighter and darker portions of the same marble. When making note of old marble works in Italy, he noted those combinations which were not quite satisfactory. Marble mouldings wanted special study, and he believed that there were a few of the younger men who were now on the right track. Difference of opinion occurred as to the boxing of a chimney-piece, but the beautiful examples of the Adam style still showed that the method was right. The Adam chimney-pieces were always of the choicest material, and their method of construction are worth studying, many of the original drawings being in Sir John Soane's museum. The Romans, he believed, produced nearly the whole of their early work out of some five quarries.

The President said that, as the evening was very late, he would content himself with asking some member to move, and another to second, a vote of thanks to the authors of the papers.

Mr. L. Alma Tadema, R.A., in proposing a vote of thanks, said that, in his studies in Pompeii, he had found that in the oldest houses the walls were decorated with painted slabs of imitative marble. He had also found in many houses the pivots of doors, that had gone, lying in lumps of beautiful onyx and precious marbles, which led him to think that the use of the precious marbles in Italy was much earlier than is generally believed. Mazois, in describing the house of Scaurus, speaks of the *atrium* having columns of Lucullian marble eleven mètres in height. Indeed, the love the Romans professed for marble columns was so great that Julius Cæsar had only to tax them to fill his treasury. Turning to Mr. Young's paper, he wished to say that he was always afraid of breaking up a moulding. They might break up a flat surface with the veins of the marble as much as they liked, but it was a pity to break up a beautiful and refined moulding. As for the view people would take 500 years hence, it was interesting to think that from the use of marbles in the present day, they might be able to judge the present moral and political state of England—when the workmen were told that there was no greater happiness than to have a good dinner, and when no workman was told that there was happiness in the work of producing something. Of course what the men cared for were the places where they could go and amuse themselves, and the churches were "not in it." Some beautiful views of a building decorated with marbles had been shown during the evening, but he was afraid he could not admire the so-called pictures of slabs on the walls, but would much prefer real pictures. They were all aware how delightful it was, in the case of a public building, to see the history connected with the place depicted on the walls, an appropriate and educating form of decoration.

Mr. G. Simonds seconded the vote of thanks, and said that it had been a pleasure to him, who, as a sculptor, had used marble for a great many years, to listen to the papers which had been read. The speakers, he thought, had been rather unnecessarily down on the use of marble for exterior purposes. It was all very well to say that the climate was this, that, and the other, and that marble would not stand out of doors. There were certain kinds which stood very well; for instance, a good Ravacione marble, commonly called hard Sicilian, which would stand the weather better than Portland stone. A few years ago he had to make a fountain, of which part was composed of bronze figures, with some Portland stone, and basins of Ravacione marble. This had now been standing for three or four years, and during the extremely bad winters the Portland stone, which was always wet, had cracked and flaked, while the marble which contained water, and had been frozen through, was just as good

as when put up. The precious marbles lost, no doubt, a certain amount of their polish, but what material would stand without that occurring, and why should people deem it essential that all the materials of which works of art were composed should be left to themselves for ever and a day, without a cleaning? Statues in this country were left to get frightfully dirty, and were then painted over a bronze colour. People put up marble columns, and, when they looked thoroughly bad and past praying for, they had them scraped and cleaned, and then put on a fresh polish. This would not be necessary if they were rubbed from time to time and kept clean.

The President, in putting the vote of thanks, said that Mr. Brindley had not only contributed his paper, but had also brought a most admirable selection of marbles for their inspection. If it would be consistent with his arrangements to leave them for a few days, so that the members could inspect them, it would be a great additional advantage.

Mr. Brindley said that he would be quite pleased to do so.

The vote of thanks was then put and carried by acclamation, and Professor Aitchison, in replying, referred to the excellent specimens which had been exhibited by Mr. Brindley that evening.

The proceedings then terminated.

THE INSTITUTE OF BUILDERS:

ANNUAL DINNER.

THE annual dinner of the Institute of Builders took place at the Hotel Victoria, Charing-cross, on Wednesday evening. Mr. John Mowlem Burt, the President, occupied the chair, and he was supported by Sir R. Rawlinson, K.C.B., President of the Institution of Civil Engineers, Mr. F. C. Penrose, F.R.S., President of the Institute of Architects, Mr. C. J. Shoppee, Col. S. G. Bird, Col. G. H. Trollope, and Mr. Niemann Smith, Master of the Worshipful Company of Carpenters. The other guests included Messrs. Frank May, J.P., L. J. Maton, J. H. Colls, Basil P. Ellis, and R. S. Henshaw, the secretary of the Institute.

The usual loyal and patriotic toasts were proposed by the President, Col. S. G. Bird responding on behalf of the "Army, Navy, and Reserve Forces."

The President next gave "The Engineers, Architects and Surveyors," and stated that the Institute was honoured with the presence of Sir R. Rawlinson, the President of the Institution of Civil Engineers, of Mr. F. C. Penrose, the President of the Royal Institute of British Architects, and of Mr. C. J. Shoppee, the past President of the Surveyors' Institution.

Sir R. Rawlinson, in responding for the engineers, said he claimed to be a workman, having sprung from a working family. His father was a builder, and until he (the speaker) was twenty-one years of age, he worked (as the fit took him) as a stonemason, a bricklayer, and as a mechanical engineer, to ground himself in the alphabet of his business. Coming to London, he had the honour to write the first report on sanitary improvement and to lay the foundation of the modern sanitary improvements which they had now obtained throughout the length and breadth of the land.

Mr. F. C. Penrose, in replying, said the architect, unlike the sculptor or painter, had no opportunity of exhibiting his work or of showing in what way he benefited the public, except through the medium of the builder, and it was of the utmost importance to the members of his profession that the builders with whom they worked should be of the stamp of the members of that Institute. It was also of the utmost importance that they should thoroughly understand each other in any work in which they were engaged. Another class of men to whom architects were very much indebted was the builder's foreman, and he had no doubt that the builders would endeavour to select the right stamp of men for the important work which they had to perform.

Mr. C. J. Shoppee also responded, and expressed the opinion that if the members of the three professions, named in the toast, continued to work in harmony the position of the builder would be well maintained.

Col. G. H. Trollope (President of the Central Association of Master Builders of London) then proposed the toast of the evening—prosperity to "The Institute of Builders." He said the Institute of Builders was a comparatively ancient institution before the Central Association came into existence. Most of the builders were members of the Institute and also of the Association, and he did not think the simile of the House of Commons and the House of Lords was inappropriate in describing the respective positions of the two bodies. The Institute was incorporated, and the Association, or the junior body, so to speak, was left to deal with the many awkward questions—at the present time exceedingly awkward—which arose in connexion with the building trade. The Builders' Institute existed with great dignity and usefulness. It undertook various duties, such as negotiations with august bodies like the Royal Institute of British Architects, and left the Central Association to fight the working men, if necessary. The present position of affairs in that connexion was not very bright. He believed, however, that they would get over the difficulty, and he hoped the outcome of all their deliberations would be peace. For many years the Builders' Institute had been coldly received in many places. This year he formed one of a committee which had the arduous task of opposing, for the benefit of the trade generally, a Bill brought in by the London County Council for the better regulation of the building trade—he did not know whether it was for better or for worse—and they were able to obtain for the first time a recognition from the Government of the existence of the Institute, inasmuch as they had now the right to receive a copy of all by-laws before they received the sanction of the Local Government Board. Then when a contract was called for by Her Majesty's Office of Works exceeding 20,000*l.* the Institute had the right to appoint a surveyor. He was sure that it was the desire of every one present that the Institute should continue to prosper, and he wished to couple with the toast the name of the President, whom he greatly respected, and considered the embodiment of what the President of an important body like this should be.

The President, in responding, referred to some of the objects of the Institute, and stated that in the unavoidable absence of the late President, the duty of opposing the London Streets and Buildings Bill devolved upon Mr. Trollope, Mr. Dove, and Mr. W. Shepherd. He considered that it was mainly owing to their exertions that some considerable improvements were made in the Bill. Another thing the Institute had in view was the arrangement of equitable forms of contract, and the encouragement of the settlement of disputes by arbitration. They lived in the days of arbitration, and the builders in London were very desirous of having a fair and equitable basis for arbitration. Other objects of the Institute were to establish a benevolent fund and to provide facilities for social intercourse between the members and their friends. They had done their best to promote the latter object that night. The President concluded by proposing the health of "The Visitors," coupled with the name of Mr. Niemann Smith, the Master of the Worshipful Company of Carpenters—a body which (he said) was doing a great deal to promote technical education.

Mr. Niemann Smith briefly responded, and stated that all the increase of income of the Company which he had the honour to represent was now used for the purpose of promoting technical education.

COMPETITIONS.

LEEK COVERED MARKETS.—The question of the appointment of an Assessor in this competition came up at the Urban District Council meeting on Tuesday, when six members voted in favour, seven against, and four abstained. The motion was consequently lost. The following letter had been addressed to the Council:—

"To the Members of the Leek Urban District Council. 21st April, 1895.

LEEK COVERED MARKETS COMPETITION.

GENTLEMEN,—We engaged in this matter, and about a month ago submitted designs in accordance with your instructions.

We do not, of course, know who else engaged in the competition, nor have we heard what steps you have taken toward a decision.

But we feel sure we speak for all the competitors, as well as for ourselves, in respectfully urging upon you the propriety of calling in expert advice to assess the merits of the various designs, a course now universally adopted in competitions which are intended to be placed above blame or suspicion.

From your final instruction we submit competitors had the right to anticipate your eventually taking this course.

We are, Gentlemen, yours faithfully,
W. SUGDEN & SON, Leek.
MOSLEY & ANDERSON, Northampton."

ARCHITECTURAL SOCIETIES.

CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING SOCIETY.—On the 17th inst., at a meeting of this Society, a paper was read by Mr. W. P. Gibbings on "Quantities." Starting with an explanation of the methods used in estimating the cost of buildings, the practices of architects taking off their own quantities, and builders being expected to take off themselves from drawings, were strongly condemned. The systems in use in various parts of the country were described. The north-country practice was easier of application, as so much detail was not dealt with as in the London practice, the two systems differing principally in the wood and mason work, and some other details. In "taking off," the lecturer considered that the best plan was to go through the building taking off each room separately, as this facilitated the reference to any item in dispute afterwards, the items of course being afterwards billed from the draft into the various trades. The necessity of checking all the items was insisted upon. The clauses often found in quantities, disclaiming any responsibility on the part of the surveyor as to their accuracy, was strongly condemned by the lecturer as very unfair to the contractor, whilst weighting the quantities was equally unfair to the client. A hearty vote of thanks was accorded to the lecturer, and, after an animated discussion, the proceedings terminated.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—To facilitate the building operations now in progress in Great George-street for new premises for the Institution of Civil Engineers it has been found desirable to abridge the Session, so that before the recess only the special meeting on May 2 and the annual general meeting on May 28 will be held, and these at the Royal United Service Institution.

THE INSTITUTION OF JUNIOR ENGINEERS.—A large party of the members of this Institution recently visited the Somers Town and St. Pancras Depôts, and Kentish Town locomotive sheds and shops of the Midland Railway, under the guidance of the district superintendent, Mr. Weatherburn, and other officials. At Somers Town were shown the 20-ton waggon-hoists communicating between the ground-floor and upper level, the hydraulic cranes and cage lifts, the three pairs of pumping-engines, the accumulators, and the electric light installation, consisting of six 25-h.-p. Thomson-Houston dynamos. Passing on to St. Pancras, the hydraulic pumping-station there was seen, and the various cranes, capstans, traversers, sack lifts, and goods hoist were examined. At Kentish Town the walls enclose two turn-tables which radiate 24 roads or stands; the engine capacity is 50, number of engines 120, and average consumption of coal (for all types of engines in the district) 28·1 lbs. per mile; total working expenses 4d. per mile. In the repairing shops, in which eight engines can be repaired at once, are overhead-travellers operated by rope-gear. There are various machine-tools and lathes for dealing with the work, which, in addition to locomotive repairs, includes the maintenance of 35 stationary engines, 39 boilers, hydraulic machinery, and electric light engines. The oil-gas plant was also seen.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting of this Association was held on the 17th inst., Mr. E. P. Loftus Brock, the treasurer, in the chair. Mrs. Dent, of Sudely Castle, sent for exhibition a careful rubbing of a Spanish tile from a church in Cordova, having considerable interest from its bearing the arms of the Count de Cabra, the captor of the famous Boabdil, the last of the Moorish kings, at the battle of Lucena, when twenty-two banners were taken by the Christians. King Ferdinand in reward for this service bestowed many favours upon the Count, amongst others, the right for himself and his descendants to bear as his arms a Moor's head crowned, with a gold chain around the neck, in a sanguine field, and with twenty banners bordering the escutcheon. These are distinctly visible upon the rubbing exhibited. This lady also submitted a large number of illustrations of encaustic tiles found at Hailes Abbey, Gloucestershire, now preserved in a pavement at Southram; others from Hailes Church and the Parish Church of Winchcombe, and from the ruins of Winchcombe Abbey, some being of the thirteenth, but the majority of the fourteenth and fifteenth centuries. Mr. Earle Way produced some examples of Roman pottery found in High-street, Southwark, on the site of the "Blue-eyed Maid" public-house, now being rebuilt. One of these formed a portion of a mortarium bearing the

letters "TUCEM," another, a piece of Samian ware, has "OF PASSIEM" within a circular label. Mr. Patrick, Hon. Secretary, exhibited some fine examples of ancient chest keys, one of Norman date, found many years ago at Birchington, in Thanet; another of Italian design and workmanship, sixteenth century, was much admired. He also exhibited a very beautiful gold medal, the badge of some foreign religious order, bearing on one side in high relief the head of the Saviour crowned with thorns, and on the other the head of the Virgin; the chasing of the ornamental bordering appears to indicate French design and execution. A paper was afterwards read by the Rev. H. Cart, M.A., describing very graphically his experiences of the journey and the impressions he derived from his recent visit to Carthage. The paper was illustrated by photographs of the chief remains of the ancient city, together with a plan of the celebrated Basilica of Damos-el-Kerita and of the famous cisterns, both before and after restoration, one of which now supplies the Goletta and Marsa, having a storage capacity of 27,000 cubic mètres of water.

GLASGOW ARCHÆOLOGICAL SOCIETY.—The Glasgow Archæological Society held a meeting on the 18th inst. in the rooms, 207, Bath-street, when Mr. David Murray, LL.D., Vice-President, was elected President in room of the late Mr. C. D. Donald, F.S.A.,Scot. Dr. John Oswald Mitchell, F.S.A.,Scot., was elected a Vice-President, and Sheriff Birnie was elected a member of Council. The following papers were then read:—"Note on Local Place-Names Available for the Designation of Civic Wards," by Mr. F. T. Barrett; "Notes on the Excavation of a Roman Bath at Newfield, Dundonald," by Mr. James Macdonald, LL.D.; and "The Story of Katherine Carmichael," by Dr. John Oswald Mitchell.

Illustrations.

BERLIN STREET ARCHITECTURE.

OUR illustrations this week form a collection of examples of modern Berlin street architecture as represented in the class of general domestic and business premises of the city and west end, and in the combination of shops and tenement buildings which are a feature of Berlin, as of Paris.

In buildings of this class Berlin architecture has shown a considerable development and improvement lately. In Government and Municipal buildings the Berlin "Academical" school of design still prevails, but in domestic and business buildings its influence is decreasing. In such buildings it is no longer considered necessary to have absolute symmetry on both sides of a façade, and the German architects have shown a disposition in these cases to study the architecture of other countries besides Italy. France and the Netherlands are much visited, and lately a good deal of attention has been given to English architecture, past and present, either through visits to this country or through the study of Mr. Gotch's examples of English Renaissance, and of the illustrations of modern architecture shown in English architectural journals. Whether this English study can very readily be traced in the designs here illustrated may be a question, but at all events there is a great deal more attempt at picturesqueness and variety than was formerly the case. One satisfactory feature in the most recent Berlin architecture is the abandonment of stucco and of attempts at cheap grandeur and pomposity of style in that material.

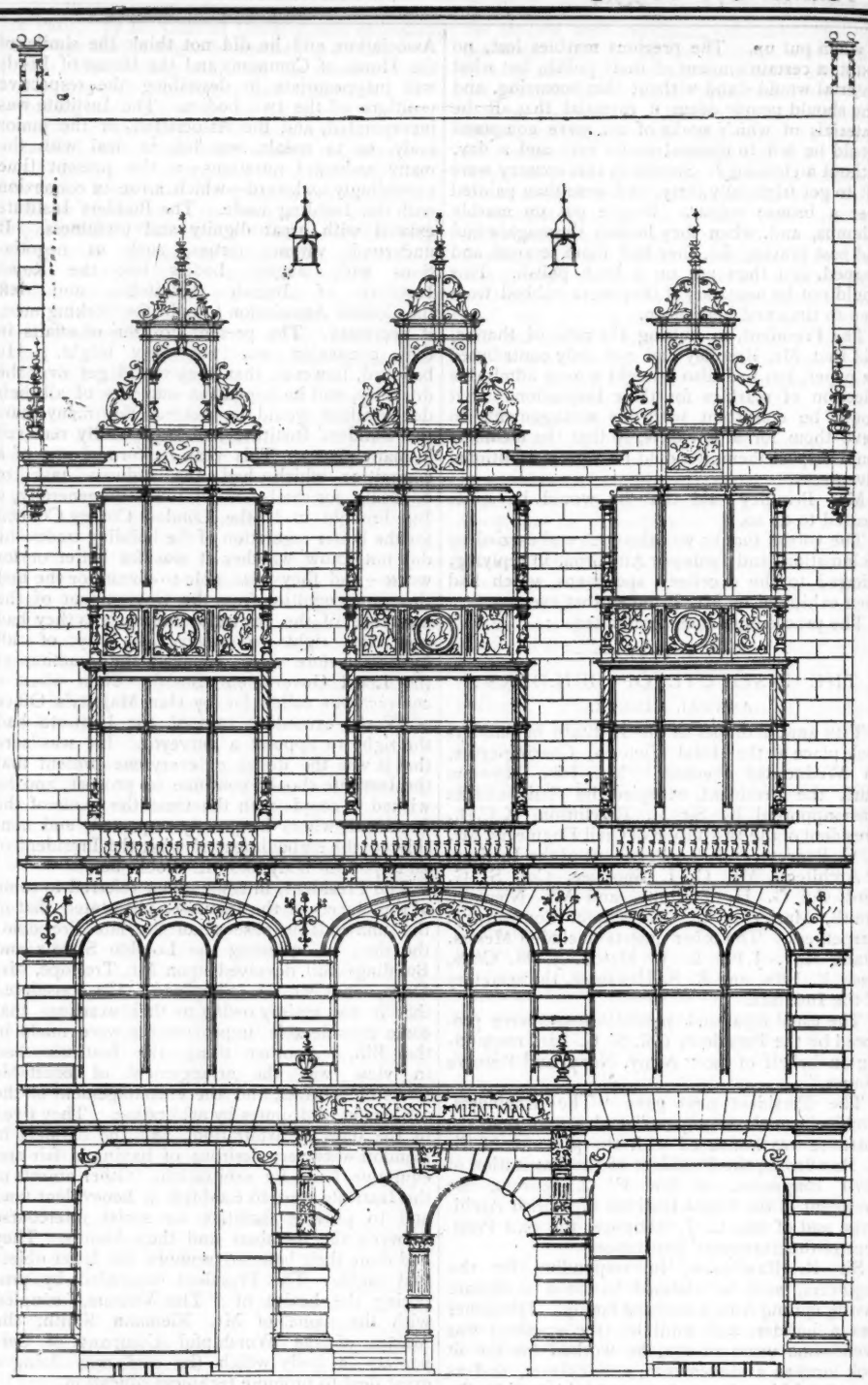
Of the buildings illustrated, the oldest is the chief office of the Berlin Electricity Supply Company. This façade belongs, with a very little modification, to the old Berlin academical school. The next in order is the "Westminster" Hotel, at the back of which is a variety theatre. Messrs. Ravene's warehouse front is an adaptation of German Renaissance. The same may be said of the two remaining buildings illustrated, in the main, though the "People's Restaurant" shows something of English influence, and "No. 16, Unter den Linden" shows a suspicion of French influence. We give some further details as to each building separately.

THE BERLIN GENERAL ELECTRICITY SUPPLY COMPANY'S OFFICES.

This building has to fulfil the requirements of a head office for the company which at present holds the monopoly of supplying Berlin with electric light. In connexion with the offices there are extensive show-rooms for electric fittings, which the company mostly supplies where it has the charge of installations. Room had to be found also for an extensive aluminium department, which is managed separately, and again has its own set of show-rooms. The upper floors have to accommodate some tenements on the main frontage, and some offices in the rear.

As will be seen from the plan of the first floor, the tenement is so arranged as to afford opportunities for giving receptions, at the cost of what we should consider the essential comfort of an abode. This is, of course, by no means unusual in a Berlin flat, but this example shows the want of comfort more plainly than is common. We may point out, for instance, the curious arrangement and position of the best bedrooms, and their distance from the bath-room and water-closet. A miniature journey has to be made through passages, dining-room, &c.; and the same holds good for the unfortunate servants in the distant kitchen, who wish to attend to the rooms. Visitors who wish to use the lavatory have to pass through the dining-room, and pass the kitchen, to reach it from the hall. Then, as will be seen, most of the rooms have the walls broken up quite indiscriminately with doors and windows. Where, we may ask, also, is the place for a bed in the front bedroom? This kind of planning, if it be termed planning at all, seems ridiculous to the English mind; and the strange part of the matter is, that there is no necessity for it, as there appear to have been both space and funds at the disposal of the architects.

The façades are in a freestone relieved slightly with bronze. The architects are Messrs. Cremer & Wolffenstein, whose names are associated with the numerous new synagogues at Berlin and in the provinces, a specialty in which they are recognised to be experts on the Continent.



Business Premises, Unter den Linden, Berlin. Herr Griesebach, Architect.

The following are the references to the lettering on the plan:—

A.—Front staircase.
B.—Reception-room.
C.—Music-room.
D.—Library.
E.—Dining-room.
F.—Boudoir.
G.—Bedrooms.
H.—Kitchen.
J.—Bath-room.
K.—Stores.
L.—Offices.
M.—Office staircase.
a.—Lavatories.
b.—Larder.
c.—Passages and lobbies.

NEW WAREHOUSE AND OFFICES, BERLIN.

Messrs. Ravene's warehouse, of which we illustrate the front elevation and ground floor plan, fulfils the proprietors' requirements for an extensive dry goods store, a large office, some stables, and, curiously to say, a picture-gallery, and some banqueting-rooms. The site has a frontage of nearly 200 ft., and a depth of over 260 ft. A large part of this is taken up by two spacious, open courtyards, and a covered court measuring 70 ft. each way. The entire block, with the exception of part of the first floor and third floor, and a small area on the ground floor level, is utilised for storage purposes. The front and central portion of the first floor contains the offices referred to, and the frontage of the third floor is taken up by the picture-gallery and banqueting-rooms. The ground floor includes a forty-stall

stable, arranged in two tiers above one another, for twenty horses each.

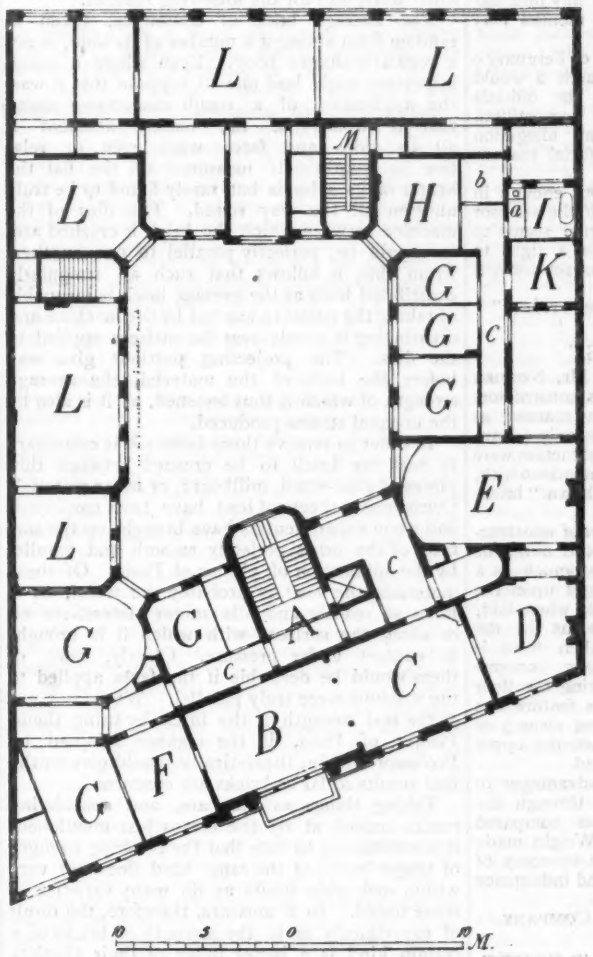
The storage accommodation is very practically arranged, the least possible space is taken up by supports, and every part of the building is well-lighted and easily approached by carts. The latter have two large gates in the main front, one for entrance, the other exit. There is also ample staircase accommodation, and there are numerous lifts. The offices on the first-floor include a large general counting-house in the central block, lighted from both courtyards, and measuring nearly 100 ft. by 60 ft., and a number of private offices and small consulting-rooms. The latter are a feature of this establishment. There are two main staircases which have their approaches from the cart entrances.

The picture-gallery and banqueting-rooms are reserved for the principals of the firm. There are three top-lighted halls, one of which measures about 55 ft. by 30 ft., and two with side light, besides some smaller rooms. A kitchen and pantry have been planned in connexion with this suite. The idea of having the halls in the warehouse is the outcome of the old Berlin custom of the heads of large establishments having their homes under the same roof as their stores and offices. As this custom does not lend itself to modern requirements, the late head of the firm at least wished some room to be set apart in his warehouse for family ceremonies and his collections.

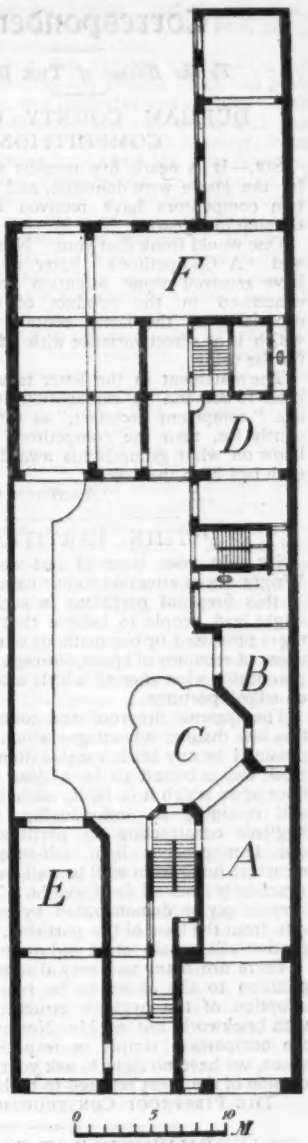
The most modern methods of construction have been adopted throughout the block, which has its own central station for heating and lighting. The façades are in brick, with free-stone facings and coloured terra-cotta ornaments, and with much elaborate wrought-iron-work. The building has had to be put up in parts, without interfering with the business, and the planning has been influenced by this, as well as by the later purchase of the ground on which the side-wings stand. Messrs. Ende & Boeckmann, whose public works at Tokio and other buildings we have frequently had occasion to illustrate, are the architects. Messrs. Hartung and Muenzenberger are the chief assistants who have had charge of the work. Professor Ende is a Vice-President of the Prussian Royal Academy, and is one of the honorary correspondents of the Royal Institute of British Architects.

The following are the references to the lettering on the plan :—

A.—Main entrances and cart entrances.
B.—Courtyards.
C.—Covered court.
D.—Stores.
E.—Engine-room.
F.—Stables (in two floors).



Berlin General Electricity Supply Company's Offices, Berlin. First Floor Plan.



No. 16, Unter den Linden, Berlin.

THE WESTMINSTER HOTEL, BERLIN.

The "Westminster" Hotel is one of two buildings lately erected by the "Unter den Linden" Building Association, the second being a Variety theatre. The two blocks stand back to back; the former facing leading thoroughfare of Berlin, "Unter den Linden," whilst the latter has its main entrance in the Behrend Strasse, which runs parallel. Messrs. Cremer & Wolffenstein were the architects of the hotel building, whilst the theatre was built from drawings by Messrs. Fellner & Helmer, of Vienna. The Berlin firm, however, acted as local architects in superintending the erection of the theatre, and the two blocks were planned in concert to ensure the least possible interference with the interests of the two establishments. In order to give the theatre an easy approach from the more important thoroughfare, an "Arcade" was arranged for, and the entrance to this arcade from "Unter den Linden" had to be designed so that it could be easily distinguished as not being part of the hotel. As will be seen from the plan, this arcade has, however, only been practically treated as a *porte cochère*, without the shops or booths that usually belong to these passages.

The whole of the ground floor of the hotel, with the exception of a small portion in the centre, is taken up by an extensive café, which is managed independently of the hotel proper. The café has its own entrances, and its own offices, and the hotel visitors need not use this part of the building. The central part of the ground floor consists of a lobby, and hall with a porter's office, and from this a staircase with a lift forms the approach to the hotel proper. The first floor is mainly utilised for the necessary reception, and dining, coffee, and reading rooms of the hotel. Only about twenty bedrooms are on this level. The upper floors are entirely utilised for bedroom accomodation; a kind of waiting-room or reception-room, however, being provided in each case off the different landings of the main staircase. There is little to call for attention in the planning, which would not fulfil London requirements, and is inferior to other examples of Berlin hotel work.

We understand, however, that this is partly due to the owners having changed the architect's "programe" during the progress of the building. The ample secondary staircases (in accordance with the Berlin Building Act), form, however, a good feature, and greatly reduce the risk from fire. The commencement of these staircases is seen on the plan, at the back of the café. All three staircases have each their own lifts. The hotel has 120 bedrooms, and the café on the ground floor will accommodate 1,000 customers.

The facades are in stone, enlivened with a certain amount of gilt wrought-iron work. The cost of the building was 48,000*l.*

The following are the references to the plan:—

A.—Hotel Entrance.
B.—Hotel Hall.
C.—Hotel Office.
D.—Café Entrance.
E.—Café.
F.—Extra Larder.
G.—Extra Kitchen.
H.—Extra Pantry.
W.—Service.
Y.—Arcade.
Z.—Lavatories.

PEOPLE'S RESTAURANT.

The new "People's" Restaurant, which has been erected from the plans of Professor Alfred Messel, is, as its name implies, an institution for providing cheap meals for the poorer class. Owing to the upper stories being let at good rents, the otherwise prohibitive expense of having an institution of this class in the very heart of the city is avoided. The ground floor, as will be seen from the plan, is entirely devoted to the eating-rooms and kitchen department. A *porte cochère* on the left side serves as an entirely separate approach to the main staircase which leads to the tenements above. The eating-rooms are divided off for men and women; and, as will be seen from the plan, about three times the space is given to the former, than to the latter. A counter serves for the distribution of the victuals, behind which there is a pantry, and then a roomy kitchen, and scullery with larder. These are all top-lighted. As will be seen there is excellent through ventilation in the long room for the men, which has large windows at the front and back. The lavatory accommodation, however, appears insufficient.

The façade is of free-stone and stucco; the latter treated slightly in polichromy. Much attentions has been given to the detail, and there is some good workmanship in the carving. The interior is treated quite plainly.

The following are the references to the plan :—

A.—Men's Room.
B.—Women's Room.
C.—Kitchen.
D.—Serving Room.
E.—Scullery.
a.—Larder.
b.—Women's Counter.
c.—Men's Counter.
z.—Lavatories.

BUSINESS PREMISES AND TENEMENTS IN UNTER DEN LINDEN.

We illustrate two buildings of this class, by the same architect, the elevation of one of them being shown in one of the lithograph plates, and the other in the subjoined block. The architect is Herr Hans Griesebach. Both buildings fulfil similar requirements.

Shops are required on the ground floor, offices on the first floor, and tenements (flats) on the upper floors. In both cases a *porte cochère* had to be provided so as to form a carriage approach to the courtyard, in accordance with that curiously extreme requirement of the Berlin Building Act which orders ample passage into all courtyards for fire-engines in case of need. There is nothing of special interest in the plans, excepting, perhaps, the arrangement of the staircase approach on one side of the passage. We illustrate the ground floor plan of No. 16, however, as a typical example. In this case one of the shops was intended for a florist, and hence the conservatory addition, which is very effective. The elevations of both buildings are of freestone, and show excellent masons' work and carving.

The following are the references to the plan :—

A.—Flower Shop.
B.—Tying Room.
C.—Conservatory.
D.—Work Room.
E.—Shop.
F.—Store.

Correspondence.

To the Editor of THE BUILDER.

DURHAM COUNTY OFFICES COMPETITION.

SIR,—It is nearly five months since the designs for the above were delivered, and for any information competitors have received the months may develop into years.

One would think that your "Note" of February 9 and "A Competitor's" letter of March 2 would have received some attention from the officials concerned in the conduct of the competition, especially as the latter contained an allegation which is at direct variance with the official reasons for the delay.

The statement in the letter is serious enough in itself to demand an explanation, for if the assessor is a "competent architect," as the writer seems to vouch for, then the competitors have a right to know on what grounds his award was set aside, if such has been the case.

"ANOTHER COMPETITOR."

"THIN PARTITIONS."

SIR,—In your issue of last week Mr. Norman Wright draws attention to our name as constructors of thin fireproof partitions in such a manner as might lead people to believe that the only advantages possessed by our methods of construction were those of economy of space, through comparison with, practically, what after all is little more than a "brick-on-edge" partition.

The hygienic fireproof and soundproof construction has distinct advantages which would never be obtained by any brick combination, insomuch as a brick wall is bound to be a dead weight upon the floor upon which it is built, each brick, when laid, still retaining its individuality, whereas in the hygienic construction the partition when filled is one homogeneous light, self-supporting concrete structure hung from wall to wall, relieving the floor practically from all dead weight. This feature can very simply be demonstrated by cutting away 3 or 4 ft. from the base of the partition, when the upper portion will remain intact and quite rigid.

There are many and very distinct advantages in addition to the above to be reaped through the adoption of the hygienic structure as compared with brickwork, but as Mr. Norman Wright made the comparison simply in respect to economy of space, we have no right to ask your kind indulgence outside of the point referred to by him.

THE FIREPROOF CONSTRUCTION COMPANY.

"GRAYDON WHEEL" AT EARL'S COURT.

SIR,—There is not a particle of truth in the rumours that the foundations of the "Graydon Wheel" at Earl's Court have become sunken on either side. Knowing that the contractor, Lieutenant Bassett (retired R.N.), was not an engineer, when I gave him the contract I took the precaution to have the work well supervised by some of the most competent engineers in England, and from the very start of the detailed drawings even, and the foundations, the expert Engineers of the London County Council have passed and approved of every step taken, and where alterations were recommended by them (such as the enlargement of the stairway passages, &c.) such recommendations have been carried out, and the work has been constantly under their observation. The public, therefore, need have no uneasiness about the foundations of the structure. By publishing this you will reassure the public and greatly oblige, JAMES WEIR GRAYDON,

Inventor, Designer, and Promoter of the "Graydon Wheel" at Earl's Court.

The Student's Column.

BRICKS AND TERRA-COTTA.—XVII.

PHYSICAL PROPERTIES.

UNDER this heading we shall give particulars as to the strength of bricks, brickwork, and terra-cotta, their absorptive powers, density, weight, hardness, and matters of like nature. These various properties are to some extent dependent on one another, and it will be the object of this article to define the limits of each, and to show in what way they are related.

Strength.—As in regard to many other building materials, the strength of bricks varies within wide limits, and a knowledge of this property is not so useful from the point of view of the bricks actually giving way when built up, as an index of their general quality from other standpoints. No one accustomed to using bricks in large quantities could ever be in doubt as to when the material was not strong enough for all practical purposes; its very appearance would proclaim the fact without the assistance of "crushing tests." When quoting the strength of bricks, therefore, it should be borne in mind that it is not done to prove the applicability of the particular bricks mentioned as being strong enough, or otherwise, for building in walls, but for consideration with other properties to be given, in enabling the student to arrive at general standards of quality from a physical point of view. We confess that we do not attach so much importance to this as to some other tests, and for the following reasons.

The average brick of commerce, taken at random from amongst a number of its kind, is not a regularly-shaped body. Even where a casual inspection might lead one to suppose that it was, the application of a rough micrometer shows that it would be the merest accident if all its sides and faces were even or relative in length. If measured on the flat the height of its sides is but rarely found to be truly uniform all the way round. The dies of the machine between which the brick is crushed are, or should be, perfectly parallel to one another. From this, it follows that such an irregularly constituted body as the average brick is incapable of taking the pressure exerted by the machine and distributing it evenly over the surfaces applied to the dies. The projecting portions give way before the bulk of the material, the average strength of which is thus lessened, as it is also by the unequal strains produced.

In order to remove these defects it is customary to bed the brick to be crushed between thin pieces of pine-wood, millboard, or other material. Occasionally sheets of lead have been employed, and some experimenters have brought up the surfaces of the brick perfectly smooth and parallel by the application of plaster of Paris. Of these materials, the lead is probably the worst, as it flows so readily and fills minor interstices on or about the surfaces with which it is brought in contact under pressure. Clearly, none of them would be desirable if the faces applied to the machine were truly parallel. We do not get at the real strength of the brick by using them. Plaster of Paris, in the manner adopted by Professor Unwin, theoretically should give us the best results so far as bricks are concerned.

Taking things as they are, and considering results arrived at by the means just mentioned, it is satisfactory to note that the crushing strength of single bricks of the same kind does not vary within such wide limits as do many varieties of stone tested. In a measure, therefore, the result of experiments as to the strength of bricks of a certain kind is a better index of their absolute strength than with similar experiments on stone. There are a few exceptions to this, however, and we would wish for more tests on the strength of bricks of one kind, from one yard, but from different kilns. The results of the majority of the experiments before us evidently refer, in each case, to half-a-dozen bricks drawn from one firing. These, obviously, are not indicative of uniform manufacture, except in so far as one kilnful of bricks is concerned.

As an index of their capability of withstanding pressure in walls, crushing tests on single bricks are of next to no use. So far is this the case, that many architects of note have refused to consider the strength of bricks apart from that of brickwork. Our information, however, on this latter point is rather scanty in respect of actual experiments, and is derived primarily from American, German, and Italian sources. At the same time, it should not be forgotten that we have an abundance of experiments carried out around us in buildings erected, and all that is required is that the results of these shall be accurately worked out, and clear statements made as to the character of the materials employed. This has only been done to a very limited extent. By such a process we should not, of course, arrive at the "crushing strength" of walls and piers, but we should obtain a mass of information on the subject of safe loads with the use of definite materials, built up under ordinary conditions. No machine hitherto invented possesses strength enough to crush piers of sufficient magnitude to invest the results with the importance they should have from a practical point of view. The only occasions an architect would be seriously called upon to calculate the strength of piers of brickwork, or rather the load they would safely carry, would be in the erection of a very large building, or in positions where they would be subjected to the pressure of heavy machinery, or of a large quantity of ironwork; and these are precisely the occasions on which feeble results of the "crushing" machine on very small piers (carefully made for crushing), would be of but little service. For the rest, the load that the smaller piers would carry should be sufficiently well-known, from the experience of their more frequent use, to obviate the necessity for experiment on the subject.

In regard to the strength of terra-cotta; so much depends on the class of material with which building blocks are filled that it is practically useless to test the "crushing weight" of the shell alone. Under certain conditions, however, the shell has to bear the brunt of the strain, whilst occasionally the thickness of the walls as compared with the size of the block is so great that the block might fairly be considered, for practical purposes, to be solid. The circumstances vary so widely with the character of building that it is not surprising that so few direct experiments on the strength of terra-cotta have been carried out. In its character as an ornamental brick, and as mouldings, the maximum weight it will carry has barely been considered from the scientific standpoint. It is, naturally, of a somewhat brittle nature, from which may be inferred that it is not very elastic, except in the sense of recording diurnal changes of temperature. That certain varieties suffer from "fatigue" seems to be fairly well established.

Porosity.—This is, perhaps, the most valuable all-round test to which bricks may be subjected; but it is not the easiest one to carry out as some have supposed. On a former occasion we have alluded to the advantage of knowing the relative porosity of bricks; what we are principally concerned with now is how to conduct experiments on the subject to yield the most promising results. It is now generally recognised that there is an intimate relationship subsisting between the crushing strength of building stones, their specific gravity and the relative amount of water they absorb; but except in a limited sense the same cannot be said for bricks and terra-cotta. The vitreous film produced on many kinds of brick, whether distinctly visible, or only ascertainable on a micro-examination, is mainly responsible for the difference in this respect between brick and stone; whilst local vitrification interiorly also impairs uniformity of results. Leaving that on one side, and looking at the matter in its broader aspects, it may at once be noted that a weak brick will usually absorb a great quantity of water, but it does not follow that a strong brick will not do likewise. As the result of direct experiment we have ascertained that it is essential to draw a distinction between the porosity of a brick (*i.e.* the relative amount of water that under a certain pressure may be passed through it) and the quantity it will absorb. Many bricks imbibe a large proportion of water but will transmit hardly any; whilst others, equally absorbent, allow most of it to pass through. This is a property that does not appear to have hitherto formed the subject of direct experiment. Perhaps the best way to investigate it is to enclose the upper part of the brick in an impervious vessel, so that the former constitutes the base of the latter. The vessel is then filled with water to a definite height, when the column will sink as the brick allows the water to pass through. A graduated scale in the vessel and a time-piece is all that is then required to register the rate of percolation. Care should be taken to thoroughly saturate the brick before commencing to read the scale, and, of course, it should be carefully set with as little cement as possible (which should also be tested) and so fixed as that the water passes through the brick only, and not through the cement as well.

Absorption, properly so called, may be tested in two ways, each useful in its own sphere. One, is to thoroughly saturate the brick by immersing it in water, or by leaving only one surface exposed to the air, the remainder of the brick being under water; the other is to test its capillarity. The former is the process usually adopted, and it is best to leave one surface exposed to the air, so that the water may freely penetrate the sides of the brick, otherwise imbibition is unduly retarded in its endeavours to expel the air from amongst the pores of the brick. In this test it is essential that the water used shall be as pure as possible, and that both it and the brick tested be of definite temperatures, otherwise results will not be strictly comparable.

The power of capillary attraction possessed by a brick has never been previously studied so far as we are aware; yet, from the point of view of permanently damp walls it is an all-important feature. We find that the power of attracting moisture within is not so closely bound up with ratio of absorption of water as would naturally be supposed, although, of course, they are to a certain extent dependent on each other. "Red-rubbers," as a rule, present the phenomenon of capillarity to advantage; if one of these bricks

be placed in water half an inch in depth the moisture will be seen to rise rapidly to a certain point, above which it will not pass, even if subjected to repeated experiments of the same nature. The height to which the water rises in each brick may be regarded as a rough approximation of its capillarity. In making this test the student should be careful to remove any moulding sand that may be adhering to the surface of the brick.

Apart from its use in determining the quality of bricks to be employed in damp situations, capillarity experiments may be directed to ascertain homogeneousness, or otherwise, in the composition of bricks; also as to whether they have been thoroughly burned. For this, break the brick in halves, and placing one half in half an inch of water as before (not on edge), observe the manner in which the moisture line rises on the broken surface of the brick. If it rises in a tolerably straight line the brick is fairly homogeneous; if, on the other hand (as is most frequently the case), that line is curved, or irregular, it shows that one part of the brick is more absorbent than another. The deleterious effects produced by hard lumps in the material are well brought out by this method, especially if the water be chemically coloured.

Density, *specific gravity*, and *weight* may be considered together, being so closely related. We purpose giving the weight of bricks when dry, also at various stages during absorption, and when fully saturated. Their true specific gravity, calculated with reference to total imbibition will be ascertained by the method detailed in our series of articles last year* on "The Structure and Physical Properties of Building Stones." The only difference will be that the actual weight of whole bricks will be given instead of weight per cubic foot, though ratios of absorption must, of course, be stated relatively.

Hardness will be expressed in terms comparable with the well-known scale of hardness of certain minerals, from the first degree of hardness to the tenth.

GENERAL BUILDING NEWS.

CHURCH, COCKINGTON, DEVON.—On the 18th inst. the foundation stone of the new church of St. Matthew, Cockington, was laid by Mrs. Mallock. The church is to be built in two sections, and the present contract includes the nave and north aisle, and has been taken by Mr. R. F. Yeo, of Torquay. Mr. C. A. Nicholson, of London, is the architect, Mr. C. Noble being clerk of works. A short description of the building appeared in our issue for June 30, 1894, together with a double-page illustration.

NEW BATHS AND WASHHOUSES FOR DEPTFORD.—Some years ago Commissioners of Baths were appointed for Deptford to look out for sites, and in 1890 designs were obtained in competition, for adapting the old Deptford Lecture Hall as Public Baths; the designs of Mr. Thos. Dinwiddy, of Greenwich, were then selected, but objections were raised in the Vestry to the proposed site. Another site in New Cross-road, of three-quarters of an acre has since been bought, at a cost of about 7,000*l.*, and the Commissioners have instructed Mr. Dinwiddy to prepare plans for the new buildings; these plans were exhibited to the Vestry of St. Paul's, Deptford, at the last meeting. The accommodation comprises a first-class swimming-bath 110 ft. by 35 ft., with galleries; a second-class swimming-bath 80 ft. by 27 ft.; slipper-baths for fifteen first-class, and thirty second-class for men, and five first-class and ten second-class for women. There is a Public Laundry, and administrative accommodation for the Board and Clerk, and Superintendent. It is proposed to sink a well on the site for the supply of the baths, for which a trial boring is to be made forthwith. In addition to the intended baths and washhouses, the architect has been instructed to prepare plans for proposed New Vestry Hall and Offices for the parish, and a committee of the Vestry have been appointed to confer with the Baths Commissioners on this part of the project.

CHURCH, RUFFORTH, YORKSHIRE.—A new church has just been erected at Rufforth. The new church has been built on a piece of ground a little to the north of the site of the old church, and consists of a chancel, nave, and south aisle, and there is a square tower from which springs a spire. On the outside the building is faced with Killinghall stone with Whitby stone dressing, and Tadcaster stone is used for the inside. The roof of the south aisle is covered with lead, which was the lead of the old church recast, and the nave and chancel are covered with red tiles. The interior of the roof is of oak, barrel vaulted, with carved figures at the feet of the principals, and carved bosses at the intersections of the moulded ribs. The chancel is paved with black and white marble. The windows are of cathedral glass, with the exception of the east window, which is of stained glass, and the subject of which is the Ascension. There is a total accommodation in the church for 180 people, the pews being of oak; in fact the whole of the woodwork in the building is of the same material. Some interesting remains in the old church have been built into the new one. The old east window is now in the east end of the south aisle, the Norman west doorway now forms the south doorway of the church, and the Norman priests' doorway has been used as the entrance to the new vestry. On the exterior of the south side of the tower is a clock, which was made by Messrs. Potts & Sons, of Leeds. The builder was Mr. J. Gould, Leeds, and the architects were Messrs. Demaine & Brierley, of York.

LUNATIC ASYLUM, RYHOPE, DURHAM.—The Sunderland Lunatic Asylum at Ryhope was opened for public inspection on the 15th inst. The architect is Mr. G. T. Hine, whose plans were selected in competition. The asylum is built of brick, with stone dressings, and in the main is two stories high. The building is of oblong shape. Around the entrance block in the centre are grouped the quarters of the assistant medical officer and a number of offices. The right wing is for the use of females, the left for males, and there is no direct communication between the two wings except by a division door on the ground floor. There are three blocks of wards—the epileptic block, the acute block, and the infirmary block. Each block has a day and night space, a general store, flour-room, scullery, and other appurtenances. Quiet patients sleep in dormitories; dangerous cases have separate bed-rooms; and there are also several padded and half-padded rooms for suicidal patients. Day-rooms are provided, in which the patients may enjoy themselves when not at work. Two features of the interior are the recreation-room on the ground floor (used also as a dining-hall), with a stage at one end for entertainments, and, immediately over it, on the second floor, the chapel. A corridor makes the circuit of the entire building. Besides the main buildings, there are numerous out-offices, including an isolation hospital, for cases of infectious disease amongst the inmates, a mortuary, and a pathological laboratory for scientific purposes, the residence of the medical superintendent, and a lodge. Later, there will be cottages for the engineer, plumber, baker, stoker, and carpenter. The asylum and its annexes cover five acres. The rest of the land is intended for the cultivation of farm and garden produce. The number of attendants and nurses averages one to every ten patients. It is expected that the institution will be ready for occupation in May. When completed, 280 patients will find immediate accommodation. The contractor is Mr. J. Howe, of West Hartlepool.

NEW SCHOOLS, WIGAN.—On Saturday last the foundation-stone was laid of the new schools of St. George's Parish, Wigan, by Lady Powell, wife of Sir Francis S. Powell, Bart., M.P. The building is three stories high, and is to replace the present old mixed schools. Besides a large central hall on the ground floor and first floor, there will be, in the basement, a large gymnasium, cookery class-rooms and work-rooms, &c. The accommodation is for 900 children, and the cost will be 6,000*l.* Mr. A. Wigan is the builder, the architects being Messrs. Heaton & Ralph, of Wigan.

ADDITIONS, BALMORAL HOTEL, EDINBURGH.—Extensive additions and alterations have recently been made at this building, consisting of a new dining-room 55 ft. by 53 ft., assembly or dining-room 58 ft. by 27 ft., writing-room, thirty visitors' and ten servants' bedrooms, lavatories, remodelled kitchen and serving-rooms, new American "Ottis" elevator, remodelled bar and restaurant, &c. The work has cost over 9,000*l.*, and has been carried out by Mr. J. Macintyre Henry, architect, Edinburgh.

NEW SCHOOLS AT PONTYPOOL.—On the 16th inst. the opening of the Pontypool mixed and infant and the Cwmffrwdoer infant school, by Sir George W. Kekewich, K.C.B., secretary of the Education Department, took place. The schools are Gothic in style, and are built of blue Pennant stone, with buff brick dressings, and Bath stone sills and corbels. They are built after the design of Mr. E. A. Lansdowne, Newport, the Pontypool School alone costing 4,000*l.* The builders were Messrs. Morgan & Evans. The Cwmffrwdoer school is also built of blue Pennant stone. The builder was Mr. A. H. Bailey, Pontnewynydd.

RESTORATION OF ST. STEPHEN'S-BY-SALTASH CHURCH.—The tower and other parts of this church have just been restored. The work has been carried out by Mr. A. Carkeek, of Redruth, in accordance with specifications prepared by Mr. George Fellowes Prynne, architect, Plymouth and Westminster. It was at first intended merely to renovate the tower, but the sphere of operations was extended so as to include the whole of the west end, a considerable portion of the south side, and the entrance porch. The stonework of the whole has been carefully picked out from the rough-cast with which it had previously been coated, and is now pointed with Portland cement. The battlements of the tower, and part of the staircase, have been taken down and rebuilt; four new pinnacles have been erected; an improved lightning conductor has been placed in position; and the whole surmounted by a central flag-staff and gilded vane. The inside walls of the porch, which were covered with plaster, have been treated in similar fashion; and the oak roof, hidden by many coats of whitewash, has been carefully scraped and exposed to view.

MASONIC TEMPLE, KELVEDON, ESSEX.—On the 18th inst., the new Masonic Temple which has been built at Kelvedon, was dedicated and opened. The building is of Bath-stone and red brick, and has been erected by Mr. S. Thorne, of Messing, from plans originally drawn by the late Mr. Alan Stewart, of Maldon, and completed by Mr. F. Whitmore, of Chelmsford. The façade is ornamented with a stone parapet, and the roof is surmounted by a cupola, which is used for ventilating purposes. Over the entrance-porch is a representation in stone of the crest of the lodge—a Knight Templar emerging from a castle and crossing a ford. Beyond the porch there is a vestibule, and extending from it a corridor leading to offices on the left and the banqueting-room. The vestibule and corridor are paved with tesselated tile. On the right of the vestibule is the reception or preparation room, and leading from that apartment is the Lodge-room, a chamber 40 ft. by 30 ft., lighted with windows of cathedral glass, on which are embossed various symbols of the order. The walls are supported by fluted stone columns with capitals in the Ionic, Corinthian, and Doric styles. At the further end is a raised daïs. There is a parquet floor of oak and walnut. To the left of the vestibule are the lavatory and offices. The building is heated by hot-water apparatus, with radiators in every room, and lighted by incandescent gasaliers.

CLARK MEMORIAL HALL, PAISLEY.—The enlarged mission-hall in connexion with Thread-street U.P. Church, Paisley, was opened on the 21st inst. Owing to ground limitations it was impossible to make the new hall wider than the old one, but the length has been increased to 57 ft., and an open timber roof, 29 ft. in height in the centre, has been added. The hall is lighted by fourteen long windows, and these have been filled with stained-glass by Messrs. Stephen Adam & Son, Glasgow. At the east end of the hall is a raised platform. The hall is seated to accommodate about 450 people, and is heated by hot water pipes. The elevation from the street is two stories in height, and the style of architecture is in harmony with the adjoining church. Part of the lower story is utilised as a manager's-room and session-house, each room being about 18 ft. square, with lavatory accommodation connected; while the upper flat has been arranged as a house for the church-officer. The contractors were:—Builder, Mr. George Henderson; slater, Mr. Charles Wallace; joiner, Mr. James Dunlop; plasterers, Messrs. John Fraser & Co.; painters, Messrs. Cowan & Stewart; gasfitters, Messrs. George Robertson & Son—all of Paisley. Mr. James Donald, of Paisley, was the architect.

RESTORATION OF ARBROATH PARISH CHURCH.—On the 18th inst. the memorial-stone of the restored parish church of Arbroath was laid. The old church, which dated from a few years after the Reformation, was accidentally burned down in November, 1892, and is now being restored from plans by Mr. J. J. Burnet, A.R.S.A., Glasgow.

SCHOOL, ULDALE, CUMBERLAND.—On the 15th inst. a new National schoolroom was opened at Uldale. The new school is built of red freestone dressings from Aspatria quarries, mixed with a lighter coloured sandstone from a local quarry. The main schoolroom is 37 ft. by 20 ft., and provides accommodation for 80 scholars, mixed. The floor is of wooden blocks, the walls inside are cemented. The class-room is 20 ft. by 16 ft. The building is slated with the best Buttermere slates with red Staffordshire ridges. The contractor for the whole of the work was Mr. J. H. Routledge, Mealsgate. Mr. A. W. Johnston, of Carlisle, was the architect.

PUBLIC WASHING-HOUSE, HUNTERFIELD, EDINBURGH.—A public washing-house was opened at Hunterfield on the 20th inst. The building consists of a boiler-house, the washing-house, which adjoins, being 35 ft. by 20 ft. The drying-closet is adjacent to the washing compartments. An ironing-room has also been fitted up. The whole cost amounts to about 1,000*l.* The architect was Mr. R. Smith, Gorebridge.

MEMORIAL CHURCH, LLANDUDNO.—The memorial stone of a church, which is to be erected in memory of the late Duke of Clarence, was laid on the 10th inst., in Llandudno, by the Duchess of Teck. The church will hold a congregation of nearly 1,000 persons. Its style is Early English, and the architect is Mr. Oldrid Scott, F.S.A.

CHANCEL, ST. AUGUSTINE'S CHURCH, NEW BASFORD.—The Bishop of Southwell (Dr. Ridding) has just consecrated the chancel that has been added to the Church of St. Augustine, New Basford, Notts. The chancel is 40 ft. in length, and of equal width with the nave. It contains a new organ-chamber, to which the organ has been removed from the side chapel; and some new choir-stalls have been furnished. The tender for the erection of the chancel was 1,335*l.*; but the total expenditure (including the renovation of the interior of the older portion and the furnishing of the new), amounts to between 1,500*l.* and 1,600*l.* Messrs. Evans & Jolley, of Nottingham, who also designed the nave and north aisle, were the architects; and Messrs. J. Hodson & Son the contractors.

* The *Builder*, Feb. 1894, p. 99.

THE GLASGOW EMPIRE PALACE OF VARIETIES.—It is proposed to alter and enlarge the Gaiety Theatre, Sauchiehall-street, Glasgow, for the purposes of the Empire Palace of Varieties. The site acquired for the purpose comprises the Gaiety Theatre, with its entrance, &c., the shops occupying the whole frontage of the property in Sauchiehall-street and the return in West Nile-street down to the corner of Sauchiehall-street. The architect is Mr. Frank Matcham, London.

PRIMITIVE METHODIST CHURCH, SPARKHILL, BIRMINGHAM.—On the 12th inst., the foundation-stone was laid of the new chapel in course of erection at the corner of Stratford-road and Wilton-road, Sparkhill. The interior dimensions of the church are: length 62 ft., width 48 ft., giving sitting accommodation for a congregation of 600 persons, a small portion of which number is provided for in a gallery at the Stratford-road end of the church, over the vestibule. The main entrance is approached by a flight of stone steps 22 ft. wide, and consists of two large archways opening to a vestibule which has double folding-doors on either side, admitting to the body of the church. The choir gallery, in which the organ is also placed, will be 19 ft. by 12 ft., and will admit a choir of about twenty members. This gallery opens on to the church by a wide arched opening, in front of and below which is placed the rostrum. Vestries are provided for the use of the minister and the choir. At the rear of the church, facing Wilton-road, is the lecture-room, 50 ft. by 22 ft., which accommodates 200 people. Passages connect the lecture-room with the church. A heating apparatus vault is provided, and the whole of the buildings will be heated by hot-water pipes. The buildings will be ventilated on the automatic principle, with Tobin's fresh-air inlets and exhaust-roof ventilators for the extraction of foul air. The buildings are designed in the Renaissance style, and will be constructed of red bricks, with dressings of Hollington stone. Internally the principal rafters are exposed, and spring from piers with stone corbels. They are constructed with hammer beams and arched ribs. The bench ends, panelled rostrum, and other fittings will be of polished pitch-pine. The contracts entered into for the total cost of the buildings—except the schools to be erected at a later period—amount to 3,700*l.* The contract for the lecture-hall has been carried out by Mr. Leonard Gosling, of Moseley-road, and the church is being erected by Messrs. J. Harley & Son, of Smethwick, The architect is Mr. A. Harrison.

THE GLASGOW BUILDING TRADE.—On the 12th inst. Glasgow Dean of Guild Court was the busiest that has been held for over twenty years. There were no fewer than 78 applications for linings, the new cases alone representing 138,000*l.* worth of new property, which it is proposed to erect in the city.

SANITARY AND ENGINEERING NEWS.

CITY OF TRURO MAIN DRAINAGE.—The scheme prepared by Messrs. Taylor & Santo Crimp has been laid before the referee, Mr. Baldwin Latham, who has signified his approval of the same. The proposed works comprise a complete system of intercepting sewers, with outfall works of a novel character, in order to meet with the tidal conditions obtaining at Truro, the outfall works being below the level of H.W.S. The sewage will be chemically treated, the effluent being discharged into the estuary on the ebb-tide. The cost will be about £10,000.

SEWERING OF FINEDON.—The Urban District Council of Finedon are projecting the complete sewering and water-supply of the town of Finedon, and at their April monthly meeting instructed Messrs. Mosley & Anderson, of Northampton, to prepare schemes for both to lay before the Council as early as possible.

ADDITIONS TO THE WATER-WORKS, PAISLEY.—The water in the three new high-level filters which have lately been added to the water-works at Stanley was turned on on the 18th inst. Each of the new filters measures 90 ft. by 60 ft., the depth being 10 ft., which allows for 6 ft. of filtering material, composed of stones, gravel, and sand. A new feature which has been introduced into each filter consists of a stationary decanter-pipe (designed by Mr. Moncur, master of works for the burgh), which enables the water to settle in the wells before it reaches the tank. The walls of the tanks are built of vitrified fireclay brick. The contractors were Messrs. Thomas Black & Co., Paisley, and the work was carried on under the supervision of Mr. Moncur, master of works.

WATERWORKS, MALVERN.—The Duchess of Teck opened the new waterworks at Malvern on the 23rd inst. Up till now the water supply for Malvern has been obtained by intercepting the water flowing from the springs in the various valleys within the Local Board district. The only storage for that water was the north reservoir, with a capacity of 738,000 gallons, and the Wyche reservoir, having a storage of 784,000 gallons. The combined storage of those reservoirs was quite inadequate to maintain a supply to Malvern during any prolonged drought, while on the other hand large volumes of water went to waste during the periods of wet weather. Under the new scheme storage has been provided for an additional 44½ million gallons, which will be collected partly from the existing drainage area of 272 acres at Great Malvern, and partly from an area of 115 acres at the British Camp reservoir. That reservoir, which was opened on Tuesday, is situate about four miles from Great Malvern, has a maximum depth of 60 ft., and the top water level is nearly 700 ft. above the sea level. The engineer is Mr. W. P. Copland, the contractor being Mr. A. Gall.

WELL-BORING AT TOTTENHAM.—Well-boring operations have just been completed for an additional water supply at Messrs. Warne & Co.'s rubber mills, Tottenham. After passing through the upper beds of the London formation, a tube well 18 in. in diameter and 400 ft. deep has been driven into the chalk, and was completed in seventy-five days by the contractors, Messrs. W. Brown & Son, of Tottenham. It is estimated that when the pump is fixed a supply of 12,000 gallons per hour will be obtainable, as Messrs. Warne & Co. have a similar well 14 in. in diameter, which was carried out by the same contractors, and a 12-in. pump fixed down the borehole six years ago, which has yielded them without intermission since completion a supply of 10,000 gallons per hour.

FOREIGN AND COLONIAL.

FRANCE.—Part of the Ecole des Arts et Métiers at Chalons-sur-Marne has been destroyed by a fire, which has caused damage to the value of more than a million francs, including the destruction of a good many curious models and machines. ——The jury of sculpture at the Salon have refused, by all but two votes, a large group sent by the Duchesse d'Uzès, which had obtained the premium in the competition at Valence, for a monument to Emile Augier. It appears that the work had not been executed by Mdme. d'Uzès, but by several little-known artists employed by her. It is understood that the lady intends to ask permission to exhibit the group in the open air among the *parterres* outside the Palais de l'Industrie. —— The town of Limoges has opened a competition for a monument to the memory of President Carnot, to be erected on the Carrefour Tourny. It is to be ready by March, 1896.——It is stated that the obelisk on the Place de la Concorde has been considerably injured by the recent severe frosts. —— A monument to the memory of Paul de Kock is to be raised in the square of the small town of Liias. The square is on the site of the former garden of the novelist.——M. Edgar Boutry, a former holder of the Grand Prix de Rome, has been appointed professor of sculpture at the Ecole Académique of Lille, in place of the late M. Darcq.——The works are being commenced for a casino at Grasse, which is to be completed in November next.——A new railway line is to be established in the Department of the Côtes du Nord, to connect the picturesque localities of Perros-Guirec, Trégiuer, and Guincamp with the railway station at Plouec.—— The Eden Theatre, near the Gare St. Lazare, is shortly to be pulled down, and the site to be used for the erection of tenement houses.——M. Bourgeois, architect, of Poissy, and M. Michelin, engineer, of Paris, have obtained the first premium in the competition opened by the municipality of Blois for the erection of a covered market.——The death is announced, at the age of 37, of M. Jules Vidal, the painter, born at Nimes, and a pupil of MM. Lehmann and Bonnat. The death is also announced of M. Assegond, founder, and subsequently honorary curator, of the museum of Bernay, one of the best collections of French ceramic work.

WINDOWS, MEMORIAL CHURCH, BERLIN.—The window in the choir of this church, to be erected to the memory of the late Emperor of Germany by the Empress, is to be carried out by Messrs. Campbell Smith & Co., of London, who will also execute two other windows in the same church to be subscribed for by the Freemasons of Berlin.

ATHENS.—There seems unfortunately to be no doubt that the remains of the Parthenon are in a very precarious state owing to the effect of the recent earthquakes. Three of the angles, the north-east, north-west, and south-west, may come down with a very small additional earthquake disturbance. The Athenian Government has been consulting M. Magne, the French architect, who made an examination of the state of the Parthenon some time ago, and more recently M. Durm, who is to issue a report in a few days. M. Durm, however, is said to be a theoretical rather than a practical architect, and the value of his report is rather doubtful. It is the engineer rather than the architect who is wanted in this case.

INDIA.—There have been serious complaints as to the water supply of Rangoon. On one morning the General Hospital authorities stated that the water was unfit for human consumption. Two schemes for additional water supply have been some time under consideration, the Hlawga scheme, which would provide a basin seven miles long by two wide, and would give a supply equal to all demands, being the favoured one, but its great cost is an obstacle at present.

MISCELLANEOUS.

LOCKWOOD'S PRICE BOOK.—This well-known publication was inadvertently omitted in our brief notice of the year's price books, under the heading "Books," in last week's issue. It continues to be a very clearly arranged book for builders' prices and memoranda for estimating, and contains also a full reprint of the new London Building Act.

SANITARY CONFERENCE AT MANCHESTER.—The members of the Sanitary Conference which commenced its sittings in Manchester on Wednesday, together with a large and representative body of citizens, attended a conversazione at the Owens College on Tuesday. The company were received at the head of the grand staircase in the museum by Dr. H. Simpson, chairman of the Manchester and Salford Sanitary Association; Dr. Sawers Scott, one of the hon. secretaries; Professor Ward, Principal of the College; and Mr. Fred. Scott. In the course of the evening the guests assembled in the central portion of the museum, where Professor Boyd Dawkins gave an address on "Sanitary progress in prehistoric times." In the course of his lecture he referred to sanitary matters in this country in the Roman times. In the first place with regard to Roman building, their buildings were all more or less rectangular, and it was important to bear in mind that there was no jerry-building in those times. Their mortar was laid on hot and not allowed to get rotten first, as was the case with us, and their cementing material was so strong and durable that it remained to-day, while a great many of the stones it cemented had disappeared into dust. And when he turned to their water supply he did not know anything more admirable. Then in the matter of drainage, they had a most perfect system of breaking the continuity of the drain inside and outside the house. The Roman excavations at Silchester showed a most elaborate and perfect system of arterial drainage; and something like 1,600 or 1,700 years ago, in the South of England, they were sufficiently advanced in sanitary matters to do very much the same sort of thing that Manchester was now attempting to do in sending her sewage by a system of arterial drains down to the lower waters of the Mersey. Their water supply, as he had said, was exceedingly well organised, and wherever they could bring a spring through a city or a villa they did so. They sunk wells sometimes to the depth of 100 ft., and they were well acquainted with the artificial methods of obtaining water. Their method of heating their dwellings was the most perfect that could be devised, consisting of a heating chamber in the basement from which a vast number of flues radiated through the dwelling. In conclusion, Professor Boyd Dawkins said that if those present could put our sanitary position into very much the same place which it occupied in this country in the time of the Romans, and in the more highly organised camps and cities, they would do one of the best works that could be done by a Sanitary Congress. He pointed to many of the contents of the Museum as confirming much that he had said in his observations. Upon the motion of Dr. Simpson, seconded by Dr. S. Scott, hearty votes of thanks were passed to Professor Dawkins and Dr. Ward.

RIGHT TO BUILD OVER A STREAM.—Messrs. Kitching, cutlery manufacturers at Sheffield, who own property and premises on both banks of the small stream, the river Porter, have appealed in the City Recorder's Court against the action of the Corporation in restraining them from enlarging and connecting their warehouses by building over the stream. The Corporation are willing to allow them to make a bridge over the stream, but not a building, although the latter took the form of a bridge as far as its relation to the stream was concerned. On behalf of the Corporation the following excerpt from the Act under which they were proceeding was read:—"No person shall at any time hereafter, without the consent of the Corporation, build, erect, or place within the borough any building or erection of permanent character in or over the bed-course or waterway of any river or stream." This was absolutely a prohibition unless those parties got the consent of the Corporation. Further, the Act said: "Provided also that any riparian owners who may desire to build, erect, or place, or cause to be built, erected, or placed, any building or erection of a permanent character in or over any part of the bed, course, or waterway of any river or stream within the borough may give notice in writing of such his desire to the Town Clerk . . . . and in the event of the Town Clerk signifying in writing to such riparian owner the refusal of the Corporation to consent then such riparian owner may appeal." The Recorder thought the Act clearly gave the Corporation an enabling power to make an exception in the case of riparian owners holding property on both sides of a stream. A bridge, it was pointed out, would not meet the needs of the appellants, and "bright goods" would be spoiled by exposure to the air in being carried across it. The objections urged on behalf of the Corporation were that the proposed building would interfere with the proper inspection and keeping clean of the stream, which is 18 ft. wide. The Recorder, in giving judgment, said that the statute was intended to be actually restricting on the one hand and enabling on the other. It was intended to give the Corporation large powers with regard to the repression of those nuisances which had in so many instances turned streams passing through large towns into sources of pollution and misfortune, and the efforts, therefore, that were being made

by the Highway Committee were deserving of praise and gratitude. It was his duty to help the Corporation to keep the stream unpolluted, but the whole tenour of the second part of the statute was to the effect that the riparian owner was to be in a preferential position, and was to be entitled to call on the Corporation to give him certain privileges which did not belong to any one but the riparian owner. It was with great difficulty that he had arrived at a conclusion. The Corporation were entitled to make such conditions as were reasonable. If the appellant built over the stream at all, it must be so done as not to interfere to any practical extent with the light, or air, or water way, and as he had not the technical knowledge enabling him to say what should be done he proposed to adjourn the matter and withold formal judgment until next session. In the meantime he hoped the surveyors on each side would consult, and present him with a joint report. The case being thus practically still *sub judice*, we offer no opinion on it, for that reason only, and not because we have not a tolerably decided one.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on Thursday, last week, at the Society's House, No. 7, Dean's-yard, Westminster Abbey, the Rev. Canon C. B. Hutchinson in the chair. Grants of money were made in aid of the following objects, viz. :—Rebuilding St. Mary's Church, Swansea, 350*l.*, and towards enlargening or otherwise improving the accommodation in the churches at Glapthorn, St. Leonard, near Oundle, 25*l.* ; Killamarsh, St. Giles, near Rotherham, 20*l.* ; Poyntington, All Saints, near Sherborne, 25*l.* ; and Watney-street, Christ Church, in the Parish of St. George's-in-the-East, 20*l.* The following grants were also paid for works completed :—Fleur-de-lis, St. David, in the parish of Bedwelty, near Cardiff, 100*l.*, ; Brixton, St. Mary, near Plymouth, 40*l.* ; Wetton, St. Margaret, near Ashbourne, 20*l.* ; St. Mabyn, near Bodmin, 40*l.* ; and Barnsley, St. Paul, 30*l.* In addition to this the sum of 427*l.* was paid towards the repairs of thirty-nine churches. The Committee sanctioned the appointment of Mr. R. Norman Shaw, R.A., as President of the Committee of Honorary Consulting Architects in the place of Mr. Ewan Christian, deceased, and two vacancies on that Committee to be filled up by Mr. T. Graham Jackson, A.R.A., and Mr. C. H. M. Mileham. The annual general court of this Society will be held on Wednesday, May 8, at the Church House, at half-past two. The chair will be taken by the Archbishop of York.

A BUILDING ACT FOR CALCUTTA.—According to the twenty-sixth report on "Sanitary Measures in India," recently laid before Parliament, the present recorded death-rate of Calcutta—twenty-seven per 1,000—places the public health in a favourably fictitious light, and the conditions of life in the metropolis of British India are still highly insalubrious, notwithstanding the progress made in sanitary reform. The health officer, Dr. Simpson, attributes much of this to the defective state of the law regarding streets and buildings, which is radically bad, as, under its sanction, unhealthy houses are built, and areas in the town created, which, as they grow, can only breed pestilence. When a house may be built anywhere without reference to efficient ventilation, proper drainage or surroundings, or in any lane or passage, irrespective of their width, and in such a manner as to obstruct the light and ventilation of the neighbouring houses, so long as it is 4 ft. away from them, the creation of plague spots in different parts of the town is only a question of time. While this process continues, the money spent on the new Harrison road and lanes cut through bustees (collections of native detached houses), will have but a poor return, because the destruction of insanitary areas effected by new roads and lanes can never even keep pace with the progressive creation of areas much worse in type. A Calcutta bustee, as it used to be, even with its drawbacks, is infinitely preferable to what is springing up in its stead. Formerly a landlord let the whole of his land for bustee purposes, and one-story huts, built irregularly and according to the requirements of the hut-owner, were erected on every available space, the spaces between the huts serving generally as passages, but occasionally the owners left sufficient room for cleansing and scavenging. Drainage and ventilation were left to themselves, and as always happens when too large a population is crowded on too limited a space, these bustees become very unhealthy and the source of epidemics. At an enormous cost narrow lanes have been cut through a number of the largest, and drainage laid down, but this advance is being counteracted by a new development, the land of bustees and of vacant spaces being sold in small plots upon which brick buildings are erected. The objections against a bustee crowded with huts, regardless of the slightest attempt at sanitation, are infinitely greater against a bustee of brick buildings. In the majority of the former, the huts were only one story high, had a large court-yard open to the sky, were built of bamboo with mud-plastered walls, and air could get into the rooms from innumerable corners and crevices. The sun had access to the courtyards, and its rays lessened or even prevented, to a great extent, putrefactive process set up by the needs and dirty habits of the inmates. The bustees and areas covered with brick buildings on the new plan will not have these advantages, the houses being, at least, two stories high, many having no courtyard, and those possessing one having it contracted to the smallest limits. The effect of a pure water supply in these districts can only be palliative. No proper drainage can be introduced into such localities, and it is doubtful whether such drainage as is possible can be of any real and lasting service. All that can be done is to pull the houses down and begin again on new lines. Nothing but a Building Act on comprehensive lines can deal with this important problem, and surely and slowly convert Calcutta ultimately into a fairly healthy city. A very large proportion of the city is still in the condition of bustee land, and accordingly it is quite easy to prevent the sale of it or any other kind of land for building plots until proper streets are laid down by the owner. Roads with a minimum width of 40 ft. are absolutely essential to ensure a healthy condition of the houses abutting thereon. The general question has given rise to the most opposite opinions among the Municipal Commissioners, who are divided into two schools on much the same lines as in London and other cities of Europe, the majority holding that land to be taken for roads should be acquired at public cost, the minority holding that in the case of property in an overcrowded city interference is necessary for the commonweal, and that the State should place such restrictions upon building, even at the cost of diminishing the value of town property, as may be essential to the public health.

SURVEYORSHIP APPOINTMENT.—At a special meeting of the Swaffham Rural District Council, held on the 17th inst., Mr. John W. B. Rooke, Assoc.M.Inst.C.E., of Brooklands, Cambridge, was elected surveyor.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.—The architectural students attending the classes of this college spent last Saturday afternoon at Glasgow Cathedral, when Professor Gourlay conducted them over the building, explaining in detail many points which he had referred to in his lectures during the session which is now drawing to a close. Attention was also drawn to the various Renaissance monuments in the cathedral and churchyard.

AN APPEAL TO NON-UNIONIST WORKMEN.—The "Alliance Carpenters' and Joiners' Protection Society" has issued a manifesto addressed to non-federated carpenters, joiners, and members of kindred trades, urging them to unite in resisting the policy of the trades unions in preventing non-union men from working with union men. The manifesto concludes :—"There are, at the present time, in London 120,000 men connected with the building trades who are non-unionists, whilst there are only 30,000 trades' unionists. Therefore, the gross injustice is only too apparent in not allowing you to work with them unmolested without purchasing a ticket, thus placing yourselves under the most abominable, hateful, and humiliating form of coercive government since the Dark Ages. Their motto is, 'take a ticket or starve'—but only take one! and then, good-by to freedom. Your will is not your own—your trade is not your own, but is at the mercy of the federation to dictate whatever terms they like, and you dare not refuse. We, therefore, impress upon you who are in the majority, to combine and resist the tyranny of those domineering few."

MEMORIAL WINDOWS, HAMILTON, N.B.—Two windows have just been placed in St. Mary's Episcopal Church, Hamilton. The subject of the first window is "The Nativity," and is inscribed—"In memory of Cecilia Cleland Urquhart." The second window, the subject of which is "Christ in the Temple at Twelve Years," is inscribed—"In memory of John Urquhart, of Fairhill." The windows were designed and executed by Messrs. Clayton & Bell, London.

LEGAL.

WOODRUFF *v.* MEESON.

AT the North London Police-court, on the 23rd inst., Mr. Woodruff appealed against an objection made by the District Surveyor for East Hackney North, under Section 150 of the Building Act, that some bath-rooms mentioned in the building notice to be 7 ft. 9 in. high were "habitable rooms," and should be 8 ft. 6 in. high. The Magistrate decided that a bath-room was not a "habitable room."

CAPITAL AND LABOUR.

THE LONDON BUILDING TRADE.—Each of the thirty-two societies affiliated to the London Building Trades' Federation have forwarded to the head-quarters of the Master Builders' Association the result of the recent balloting in their respective unions on the subject of the proposed amended working rules for the building trades in the metropolis submitted by the Association. There was a large preponderating vote in favour of adhering to the agreement of 1892, but up to the present the officials of the Federation have declined to publish the precise figures. The communications which have been forwarded from the various societies were considered at a meeting of the master builders on Thursday. The feeling among the masters is that there is but little danger of a strike. They still maintain that the sole point of serious disagreement between the two sides has reference to the employment of non-unionists, and that the question of sub-letting does not complicate the situation in the least. On the other hand, Mr. J. Verdon, the secretary of the Federation, in the course of an interview, said the existing deadlock had arisen over the demand made by the Masters' Association to insert a new rule recognising the principle of sub-letting work. The real difficulty was not as to the employment or non-employment of non-union hands, but as to this question of piecework, which the men considered to seriously affect their interests.

PLASTERERS' STRIKE, MANCHESTER AND SALFORD.—The operative plasterers and their labourers in Manchester, Salford, and surrounding districts are at present on strike. A short time ago the plasterers, who were then receiving pay at the rate of 8½d. per hour for a week of fifty-two hours, made application to their employers for an advance of 1d. per hour, and the labourers, who were getting 6d. an hour, asked for an additional ½d. an hour. The men also demanded that what was known as the two-miles radius should be reduced to one mile. The Manchester and Salford Association of Master Plasterers and Painters—who are federated with the whole of the building trades in the country—have considered the applications of the men, and decided to concede to the plasterers an extra halfpenny an hour and the labourers an extra farthing. The masters, however, have determined not to reduce the two-miles limit, and point out that recently the operative carpenters and joiners agreed to a three-miles boundary. The refusal of the masters to concede the demand in the matter of the boundary has resulted in a large number of local plasterers and labourers coming out on strike. The question is a small one, and ought to admit of easy adjustment.—*Manchester Guardian.*

THE MANCHESTER BUILDING TRADE.—At a meeting of the carpenters and joiners of Manchester on the 18th inst. it was announced that the master builders had conceded an increase of a halfpenny per hour, and a reduction of hours from 52 to 49½ per week, the alteration to come into force on June 1. Several minor points were left for decision by a committee representing both sides, but the employers decline any concessions as to walking-time, grinding-time, and the question of notice, otherwise than in accordance with the present rules.

STRIKE OF THE LEICESTER CARPENTERS.—There are now signs that the dispute between the master builders and the carpenters and joiners of Leicester will soon be ended. The committee of the Master Builders' Association met on the 19th inst. and considered a letter received from the representatives of the men, offering to meet the representatives of the Association on certain conditions. After careful consideration it was decided that a reply be sent to the Carpenters' Society to the effect that the representatives of the employers would meet the men's delegates upon the understanding that no conditions were imposed.

MEETINGS.

FRIDAY, APRIL 26.

Architectural Association.—Mr. C. W. Whall on "Painting, and its Relation to Architecture." 7.30 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Mr. H. P. Boulnois on "Scavenging, Disposal of House Refuse." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. Bernard Godfrey on "Brine Pumping." 8 p.m.

Institution of Mechanical Engineers.—General Meeting (concluded). 7.30 p.m.

SATURDAY, APRIL 27.

Architectural Association.—Visit to St. Olave's Grammar Schools, Southwark. 3 p.m.

Incorporated Association of Municipal and County Engineers.—Lancashire and Cheshire District Meeting, to be held at Stockport.

St. Paul's Ecclesiological Society.—Visit to Chislehurst, under the guidance of the Rev. Canon Murray. Trains leave Cannon-street at 2.30 p.m. and 2.55 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Inspection and Demonstration of the Sewage and Destructor Works, Ealing. 2.15 p.m.

London and Provincial Builders' Formen's Association (Memorial Hall, Farringdon-road, E.C.)—Quarterly Meeting. Adjourned discussion on "Past and Present Apprenticeship." 9 p.m.

Northern Architectural Association.—Visit to Billingham and Norton Churches. Conference at Stockton in the evening.

Edinburgh Architectural Association.—Visit to (1) Crichton Castle and Church; (2) to Borthwick Castle and Church.

Queen's College, Cork.—Mr. Arthur Hill on "The History of Architecture." XX. 3 p.m.

MONDAY, APRIL 29.

Surveyors' Institution.—Adjourned Discussion on Mr. G. Cadell's paper on "Forestry." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. James Douglas on "Recent American Methods and Appliances Employed in the Metallurgy of Copper, Lead, Gold, and Silver." II. 8 p.m.

WEDNESDAY, MAY 1.

Royal Archæological Institute of Great Britain and Ireland.—(1) Mr. T. J. Willson on "The Structure of the Castle at Lincoln." (2) The Worshipful Chancellor Ferguson, LL.M., F.S.A., on "A Collection of Chapbooks in Tullie House, Carlisle." 4 p.m.

British Archæological Association.—Annual General Meeting. 4.30 p.m.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Public Baths	Chester T. C.	50*l.*	June 2
*Sewage Disposal Scheme	Towcester Parish Coun.	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Shops and Offices, Donegall-square North	Belfast Banking Co. Lim.	W. H. Lynn	April 30
Road Works, near Gilfach, Glam.	Llantrisant, &c. R.D.C.	J. Griffiths	do.
House and Premises, St. John's-walk, Bridlington Quay	J. Siddall	J. Earnshaw	do.
Pair Semi-detached Villas, Western-road, Cork	.....	W. C. Ryder	do.
House and Stable, Rayleigh, Essex	.....	Jas Thompson	do.
Rebuilding Calvinistic Methodist Chapel, Trecynon, Aberdare	Thos. Edwards	.....	do.
Chapel and Schools, Cwmaman, Aberdare	Rev. W. D. Morris	.....	do.
*Making-up Roads	Tottenham U.D.C.	P. E. Murphy	do.
*Tar Paving	Borough of Croydon	*Official*	do.
Granite Road Metal, Boston, Lincs.	Sibsey R.D.C.	do.	do.
Road Construction, Vale View-road	Dover Town Council	do.	do.
Station Buildings, Kingswood, Warwickshire	G. W. R. Co.	do.	do.
Stables, Henley	do.	do.	do.
Clee Hill and Chepstow Stone	Stroud U.D.C.	do.	do.
*Blue Pennant Kerb	Woking U.D.C.	do.	May 1
Hotel, Stables, &c. Pontygwarth, Tylorstown, Wales	G. Davies	F. Gibson	do.
Macadam (7,000 tons)	Driffield(Yorks)R.D.C.	T. C. Beaumont	do.
Whinstone	Howden(Yorks) R.D.C.	J. Anderson	do.
Buildings, Lion and Field Estate, Rowhedge, Colchester	.....	G. H. Page	do.
Baptist Chapel, House, &c. Stanwell-road, Penarth	.....	Jones & Co.	do.
Kentish Flint (1,500 cub. yds.), Southend-on-Sea	.....	H. Harlock	do.
Rebuilding, Butchers' Arms Hotel, Pontypridd	.....	F. Gibson	do.
School, Poplar-road	Wrexham National School Managers	J. Morrison & Son	do.
Waterworks, Ferns	Enniscorthy Union	M. Barry	May 2
Timber Bridge, River Foss, York	H. Leetham & Sons	W. G. Penty	do.
Machinery Building at Sewage Works, Scout	Mossley (Lancs) T.C.	T. S. M'Callum	do.
Granite Road Metal	Lutterworth R.D.C.	T. Henry	do.
Widening, &c. Locking-road	Weston-super-Mare U.D.C.	H. Nettleton	do.
Mill Chimney, &c. Burdett Mills, Milnsbridge, near Wakefield	.....	J. Kirk & Son	do.
Distillery, Cottages, Warehouses, &c. Kingussie, N.B.	.....	Alex. Mackenzie	do.
Rebuilding, Travellers' Inn, South Kirby, near Huddersfield	.....	W. E. Richardson	do.
Iron Bridges, Hopes, near Eccles	Salford Union	*Official*	do.
Broken Granite (5,000 tons), Lincoln	Welton R.D.C.	do.	do.
*Cleaning and Painting Works	M. R Co.	do.	May 3
Whinstone and Slag (3,000 tons)	Easingwold (Yorks) R.D.C.	do.	do.
*Painting Works	Parish of St. George's-in-the-East	do.	do.
*Alterations to Laundry	do.	Wilson, Son, & Aldwinckle	do.
Enlarging Methodist Church, Camelford, Cornwall	Rev. J. Needham	Wise & Wise	do.
Sewering, &c Bank's-avenue and other places, Pontefract	.....	Tennant & Bagley	do.
Bank Premises and Shops, Shelton and Fenton, Staffs.	.....	R. Scrivener & Sons	May 4
Infirmary, Griffithstown, Newport, Mon.	Pontypool Union	E. A. Lansdowne	do.
Levelling, Kerbing, &c. Bradbourne Park-road	Sevenoaks U.D.C.	J. Mann	do.
Broken Granite, Limestone, &c.	Wakefield R.D.C.	F. Massie	do.
Congregational Church, Johnstown, Ruabon	Rev. J. Ogmore Morgan	.....	do.
*Pulling Down Houses	Met. Asylum Board	E. T. Hall	May 6
*Mortuary Buildings	Rotherhithe Vestry	N. Scorgie	do.
Enlarging School (Pottery)	Belper School Board	S. R. Bakewell	do.
*Repairs and Painting at Asylum Buildings	Central London Sick Asylum District	W. S. Cross	do.
Extensions, &c. to Store Buildings, near Bradford	Queensberry Indus. Soc. Ltd.	Jno. Drake	do.
Schools, Kelbrook	Thornton-in-Craven School Board	Thos. Bell	do.
Sewering, Levelling, &c. West-street and others	Morecambe R D.C.	J. Bond	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered
Sluices, Skirbeck Quarter, Boston, Lincs.	Drainage, &c. Comm.	B. H. Bicknell	May 6
Labourers' Cottages	Dunshaughlin Union	A. Scott	May 7
Storage Tank, Pipe-Laying, &c.	Llantrisant & Llantwit Fardre R D.C.	G. S. Morgan	do.
Underground Convenience, High-street	Colchester Corp.	H. Goodyear	do.
Additions, &c. to Grammar School, Ruabon, Denbigh	Governors	.....	do.
*Painting, &c. at Infirmary	Whitechapel Union	B. J. Capell	do.
*Pipe Sewers, &c.	Willesden Dist. Coun.	O. Claude Robson	do.
*Sewer Works	Acton U.D.C.	D. J. Ebbetts	do.
Additions, &c. to Grange Hall, Downpatrick	.....	Wm. Batt	do.
Granite Road-Metal (6,000 tons)	Branston R.D.C.	*Official*	do.
Additions to Schools, Arragon-road	Managers of Twickenham Paroch. Schools	do.	do.
*Painters' and Plumbers' Work	Com. of Sewers, City of London	do.	do.
*Engineers' Work	do.	do.	do.
*Carpenters' Work	do.	do.	do.
*Waterworks	Kendal Corporation	G. F. Deacon	do.
*Sewage Works	Wellingboro' U.D.C.	G. & F. W. Hodson	do.
*New Road and Sewer	Alleyn's College, Dulwich	J. Barry	do.
Filter Beds, Cottages, &c. Muggleswick, Durham	Consett Waterworks Co.	T. & C. Hawksley	May 8
Filter Beds, Valve Wells, &c.	Exmouth, &c. Waterworks Co.	E. Cousins	do.
Sewerage Works	Leigh and Atherton (Lancs.) Joint Sew. B.	Banks & Co.	do.
Road Materials, near Guildford	Hambledon R.D.C.	G. Lintott	do.
*Supply of Materials	Richmond Main Sewerage Board	W. Fairby	do.
Additions to Workhouse Hospital, Lancaster	.....	J. Parkinson	do.
*Supply of Stone or Granite	Bexhill-on-Sea U.D.C.	*Official*	May 9
New Gates, North Dock Entrance	Swansea Harbour Trus.	A. O. Schenk	do.
Road Metal (1,000 cubic yards)	Bexhill-on-Sea U.D.C.	M. D. Graves	do.
Re-making Turner and other Streets, near Blyth, Northumberland	Cowper U.D C.	R. Grieves	do.
*Two Concrete Groynes, and a Sea Wall	Brighton Town Council	F. J. C. May	May 10
Laying Water Pipes, near Barnsley	Stainsbrough Parish Council	*Official*	do.
Schools	Havant School Board	A. E. Stallard	May 11
*Public Hall, Club House, and Four Shops	Cleethorpe's Public Hall Co.	J. R. Withers	do.
Business Premises, Beccles, Suffolk	Working Men's Co-op. Assoc.	.....	do.
*Electric Lighting Machinery	Manchester Corp.	T. de Courcy Meade	May 13
Limestone	Abergavenny R.D.C.	J. Gilt	May 14
*Municipal Offices	Gravesend Town Coun.	A. G. Smith	do.
*Post Office, Fulham	Com. of H. M. Works	*Official*	do.
Sewerage Works, Framlingham, Suffolk	Plomesgate R.D.C.	T. Miller	May 15
*Enlargement of Nurses' Home	Kensington Guardians	T. W. Aldwinckle	May 16
Pipe Sewers, &c.	Easingwold Union	*Official*	May 17
Sewerage Works, near Burnley	Barrowford U.D.C.	J. T. Landless	May 20
*New Laundry, Machinery, &c.	Mile End Old Town Guardians	C. F. Burden	May 23
*Erection of New Laundry	do.	do.	do.
*Repairs and Materials (Liverpool Dist.)	War Department	*Official*	May 31
Horse Repository, Penarth-road	Cardiff Horse Repository Co. Lim.	Veall & Sant	No date
Shoe Factory, Station-road, Rushden, Northants	H. Perkins	H. Adnitt	do.
Five Cottages, Outwood, near Wakefield	.....	R. Wood	do.
Two Houses and Bakehouse, Barnes-road, Skelmersdale	.....	Mr. Rigby	do.
Bridge Works, Maidenhead, &c.	Berks. C. C.	J. Morris	do.
House and Workshop, Gadley-street, Burnley	E. Bishop	Riley & Nutter	do.
Additions, &c. to Offices, Flowergate, Whitby	W. Seaton Gray	.....	do.
*Building Materials to Convict Prisons	Directors of Convict Prisons	*Official*	do.
*Painting Works, North Aldershot	War Department	do.	do.
*Temperance Hall	Cardiff Temperance Hall Trustees	J. P. Jones, Richards, & Bugden	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
Highway Surveyor, Leighton Buzzard	Linsdale R.D.C.	.....	April 30
*Clerk of Works	Bexley School Board	.....	May 1
*Surveyor	Teddington U.D.C.	250*l.* &c.	May 8
*Road Foreman	do.	2*l.* 2*s.*	do.
*Surveyor and Inspector of Nuisances	Abingdon R D.C.	150*l.*	May 11
*Surveyor	Lexden and Winstree R.D.C.	150*l.*	May 5
*County Surveyorship (Ireland)	Civil Service Com.	.....	May 2

Those marked with an asterisk (*) are advertised in this Number. *Competition, p.* iv. *Contracts, pp.* iv., vi., vii., viii., ix., *and* xxi. *Public Appointments, p.* xviii.

Carpenters' Hall, London Wall (*Lectures for shop and outdoor Foremen in Carpentry and Joinery*).—Professor Banister Fletcher on "Timber Roofs, also Composite Roofs." 8 p.m.

Builders' Foremen and Clerks of Works Institution.—Ordinary meeting of the Members. 8 p.m.

Liverpool Engineering Society.—Annual General Meeting. Discussion upon miscellaneous communications. 8 p.m.

Edinburgh Architectural Association.—Mr. John Burn on "Plumbing." 8 p.m.

THURSDAY, MAY 2.

Institution of Civil Engineers (*Special Meeting in the Theatre of the Royal United Service Institution. Whitehall*).—The Third "James Forrest" Lecture, by Professor W. C. Unwin. B.Sc., F.R.S, M Inst.C.E, on "The Development of the Experimental Study of Heat-Motors." 8 p.m.

Society for the Encouragement of the Fine Arts."—Dr. Phené, F.S.A., on "The Social Influence of Art." 8 p.m.

Civil and Mechanical Engineers' Society.—General Meeting. Mr. W. Beer on "Railway Bridge Design." 7 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, MAY 3.

Institute of Junior Engineers. — Mr. Ernest King and Mr. Kenneth Gray on "The Warming of Buildings by Hot Water." 8 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

5,248.—DOOR SPRINGS: *J. Matthews.*—An arrangement for bringing the door into a closed position when moved either inwards or outwards. Consists of a spiral spring wound round a flexible core and mortised into the banging stile of the door. The whole is kept in position by a plate fixed to the edge of the door and provided with a socket upon which the spring can rest. The core is connected to the plate by an eye-piece and at the other end to a screwed rod. A lever with a thumb-piece is used for controlling the action of the spring. Various forms of plates are used to suit the construction of the doors.

5,734.—WINDOWS: *P. Manning.*—Deals with methods of fixing lines to ordinary sash windows and reversing the sashes for cleaning purposes. The lines are attached by fastening them to small rings fitting into claws mortised into the sashes. A hinge made in two parts to fit into each other is employed for reversing the sashes.

5,961.—WINDOWS: *T. Shurmer.*—To facilitate cleaning, glazing, &c., ordinary sashes and frames are used having a second inner swinging sash, which holds the glass, and may be opened into the room. The opposite side of each swinging sash is fastened to the ordinary sash by a dovetailed metal piece fitting into a slot.

1,944.—BRICKS: *T. Aldridge.*—Refers to bricks formed with conical projecting studs on one surface with corresponding recesses on another surface, arranged so that each brick will tie and bind with adjoining bricks. These bricks may be used without cement or mortar.

2,774. — CLOSET-PANS: *J. Landells.* — A closet-pan formed to rest upon a flange, its top being four or five inches above the floor, and put forward as being most suitable for natural use.

NEW APPLICATIONS FOR LETTERS PATENT.

APRIL 8.—7,131, F. Barker, Exhaust Ventilators.—7,135, H. Akeroyd, Water-closets.—7,138, J. Shaw, Automatic Down-cast and Up-cast Cowl for Sewers, Drains, &c.—7,155, W. Edwards, Window Fastener.

APRIL 9.—7,195, A. Downay, Brick-clay, Fire-clay, &c.—7,212, G. and J. Dyke, Door Bolts.—7,218, P. and H. Wilcox, Window Fasteners.—7,243, W. Buck, Fittings for Chimneys to prevent Down Draught or Smoking.—7,257, J. Tucker, Draught Excluder for Doors.—7,261, A. Kliemchen, Roofing Tiles.—7,276, A. Bonet, Upholstery Work.—7,277, S. Smith, Drainage Flooring or Paving.—7,282, J. Trantorn, Window Fastenings.—7,284, K. Siebold, Facings for Walls, &c.

APRIL 10.—7,314, G. Anderson, Stone Sawing Machinery.—7,320, T. Robinson, Window Fasteners.—7,334, W. Bailey, Bevelling Glass.—7,368, K. Kolker and others Paints.

APRIL 11.—7,377, P. Wilson and W. Wright, Steam Traps.—7,382.—W. Murchland, Water-closets.—7,384, G. Kirk, Glass for Roof-lights, Windows, &c.—7,388, F. Fremont, Windows.—7,401, M. Lauder, Grates and Stoves.—7,412, S. Snape and J. Galloway, Syphon Discharge Cisterns for water-closets.—7,425, H. Simmonds and J. Delaney, Kilns.—7,459, G. Balsley, Building Bricks.—7,479, F. Bennett, Facilitating Building Operations.—7,480, G. West, Fire-stoves, &c.—7,487, J. Wood, Sash-fasteners.

APRIL 13.—7,506, T. Stubbs, Decorating Tiles, &c.—7,530, E. Green, Socketted Pipes.—7,542, G. Jenkins, Artificial Stone.—7,543, L. Mathieu, Water-closets.—7,550, J. Mackintosh, Window Attachment.—7,559, E. Larcher-Servais, Forced Draught and Smoke consuming Apparatus for Chimneys, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

5,171, T. Twyford. Water-closets or Water-closet Basins.—5,365, J. Macdonald, Siphon-flushing Cisterns.—5,366, J. Macdonald. Oil-lamps for Removing Paint, Plumbers' Work, and other like purposes.—5,837, B. Hodgson, Window-fastener.—6,083, J. Campbell, Certain Colours or Pigments.—6,237, E. Böhm, Enamelled or Glazed Bricks and Tiles.—6,339, R. Pollard and R. Gibbs, Grindstones.—6 359, H. Stockman, Walls and Piers for Sea Defences.—6,492, W. Tickle, Saws.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

11,183, J. Cartland and J. Lilly, Movable Casement, Opening, Closing, and Securing Mechanism.—16,643, H. Leigh, Adjustable Sliding-sashes.—24,745, F. Curley, Detachable Ornamental Fibrous Plaster Covers for Electric Light Ceiling Fittings.—3,561, J. Kleine. Fire and Damp-proof Ceilings and Walls.—4,653, S. Bartlett, Raising and

Lowering of Window-sashes.—5,008, T. Stubbs, Decorating Tiles, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 9.—By *Debenham, Tewson, Farmer, & Bridgewater:* 12, Crane-ct., Fleet-st., f. area, 750 ft., 2,400*l.*; 4, King-st., Tower-hill, f., r. 80*l.*, 1,300*l.*—By *Jones, Lang, & Co.:* I.g.r. of 450*l.*, Jewry-st., Aldgate, u.t. 80 yrs., g.r. 360*l.*, 1,450*l.*—By *Wilkinson, Son, & Welch* (at Brighton): "Ashlea" and "Fairford," Sackville-gardens, Hove, f., 1,300*l.*—By *Boyton & Pegram* (at Walham-green): 4, Townmead-rd., Fulham, u.t. 87 yrs., g.r. 5*l.* 10s., 154*l.*; 7 and 8, Wheatsheaf-ter., u.t. 84 yrs., g.r. 14*l.* 14s., 400*l.*; 39 to 49 odd, Orbain-rd., u.t. 90 yrs., g.r. 25*l.* 4s., r. 156*l.*, 648*l.*; 13, Munster-rd., u.t. 86 yrs., g.r. 8*l.* 10s., 230*l.*; 15, Munster-rd., u.t. 86 yrs., g.r. 8*l.* 10s., r. 34*l.*, 240*l.*

APRIL 10.—By *M. Liell & Son:* 6, Addington-rd., Bow, u.t. 52 yrs., g.r. 4*l.* 10s., r. 40*l.*, 350*l.*; 24 and 26, Addington-rd., u.t. 52 yrs., g.r. 9*l.* 4s., 680*l.*; 43, Fairfield-rd., u.t. 34 yrs., g.r. 3*l.* 10s., 225*l.*; 47, Fairfield-rd., u.t. 34 yrs., g.r. 3*l.* 10s., r. 28*l.*, 230*l.*; 1, St. Thomas's-rd., Mile End, u.t. 55 yrs., g.r. 3*l.* 15s. 6d., r. 30*l.*, 205*l.*; 45 and 46, Cotton-st., Poplar; 3, Wright's-pl.; and 1 and 2, Providence-pl.; f., 750*l.*; 61 and 63, Walker-st., Limehouse, u.t. 75 yrs., g.r. 7*l.*, 500*l.*; 70, Walker-st., u.t. 69 yrs., g.r. 3*l.* 10s., 235*l.*

APRIL 11.—By *Geddes & Austin:* 1 to 8 and 17 to 20, Matilda-pl., Bermondsey, and 20, 21, and 22, Foxlow-st., u.t. 20 yrs., g.r. 45*l.* 300*l.*

APRIL 17.—By *T. N. Turner:* 22, Albion-rd., Hampstead, u.t. 49 yrs., g.r. 10*l.*, r. 70*l.*, 600*l.*—By *W. Houghton:* 3, Chestnut-rd., Lewisham, f., r. 42*l.*, 50*l.*

APRIL 18.—By *Joseph Hibbard & Sons:* 5, 7, 9, 11, 13, and 15, Bagallay-st., Burdett-rd., E., u.t. 67 yrs., g.r. 18*l.* 18s., r. 143*l.*, 770*l.*; 10 to 18, Wilson-st., u.t. 67 yrs., g.r. 29*l.* 4s., r. 216*l.* 9s., 1,210*l.*; 1 to 6, Salisbury-st., u.t. 67 yrs., g.r. 17*l.* 17s., r. 143*l.*, 775*l.*; 7 to 12, Salisbury-st., u.t. 67 yrs., g.r. 17*l.* 17s., r. 141*l.* 14s., 770*l.*; 2, Nightingale-rd., Clapton, f., r. 50*l.*, 650*l.*; 21, 23, 39, and 41, Arlington-st., Islington, u.t. 32 yrs., g.r. 21*l.*, r. 136*l.*, 1,020*l.*; 25, 27, 29, 43, and 45, Arlington-st., u.t. 32 yrs., g.r. 26*l.* 5s., r. 170*l.*, 1,260*l.*; 70, Tachbrook-st., Pimlico, u.t. 32 yrs., g.r. 9*l.*, r. 55*l.*, 440*l.*; By *Newton & Co.:* The Peckham Rye Tabernacle, Peckham Rye, and ground in rear, f., 6,800*l.*; 27, Canonbury Villas, Canonbury, u.t. 24 yrs., g.r. 8*l.*, r. 48*l.*, 320*l.*; 3, Canonbury Pk. North, u.t. 41½ yrs., g.r. 5*l.* 10s., r. 55*l.*, 400*l.*; 59, Mayville-st., Stoke Newington, u.t. 64 yrs., g.r. 5*l.* 10s., r. 32*l.*, 230*l.*; 77 and 79, Geneva-rd., Brixton, u.t. 71 yrs., g.r. 12*l.*, r. 94*l.* 18s., 500*l.*; 81 and 83, Geneva-rd., u.t. 71 yrs., gr. 12*l.*, r. 94*l.* 18s., 530*l.*; By *Cockett & Henderson:* 1, Avondale Villas, Buckhurst Hill; sold privately.—By *Stimson & Sons:* Broomwood, Broomwood-rd., Clapham-common, f., r., 172*l.*, 3,500*l.*; a block of building land, Thurleigh-rd., f., 510*l.*; 210, Westmoreland-rd., Walworth, u.t. 50 yrs., g.r. 10*l.*, 210*l.*; 3, Hewson-rd., u.t. 48 yrs., g.r. 5*l.*, 300*l.* 24, Wansey-st., u.t. 48 yrs., g.r. 5*l.* 5s., r. 38*l.*, 365*l.*; 57, Gurney-st., u.t. 48 yrs., g.r. 5*l.* 5s., r. 38*l.*, 335*l.*; 42, Boyson-rd., u.t. 56 yrs., g.r. 6*l.* 10s., r. 70*l.*, 650*l.*; 78, Bellville-rd., Wandsworth, f. 440*l.*; 47, James-grove, Peckham, u.t. 31 yrs., g.r. 4*l.*, r. 26*l.* 8s., 185*l.*; 1, Rochester-rd., Camden-rd., u.t. 47 yrs., g.r. 6*l.*, 550*l.*; a plot of building land, Overhill-rd., Dulwich, f., 250*l.*

APRIL 19.—By *G. A. Wilkinson & Son:* 39, Narrow-st., f., r. 50*l.*, 440*l.*—By *Cullerne & Co.:* 104, 106 and 108, Haselrigge-rd., Clapham, u.t. 81 yrs., g.r. 15*l.* 15s., 770*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a., for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.	ton	8/0/0 0/0/0
Teak, E.I.	load	10/0/0 16/0/0
Sequoia, U.S. ft. cu		1/10 2/2
Ash, Canada	load	2/15/0 4/0/0
Birch, do.		2/15/0 4/0/0
Elm, do.		3/10/0 4/15/0
Fir, Dantsic, &c.		1/15/0 3/10/0
Oak, do.		2/15/0 4/15/0
Canada		5/10/0 7/0/0
Pine, Canada red		2/15/0 3/5/0
Do. Yellow		3/5/0 5/10/0
Lath, Dantsic, fath		4/10/0 5/10/0
St. Petersburg		5/0/0 6/10/0
Wainscot, Riga, &c., log		3/0/0 5/5/0
Odessa, crown		3/0/0 5/5/0
Deals, Finland		
2nd & 1st std	100	7/0/0 8/10/0
Do. 4th & 3rd		7/0/0 8/0/0
Do. Riga		7/0/0 8/0/0
St. Petersburg, 1st yellow		9/10/0 12/0/0
Do. 2nd yellow		7/10/0 9/0/0
Do. white		8/0/0 9/10/0
Swedish		7/0/0 15/10/0
White Sea		7/10/0 15/0/0
Canada, Pine 1st		21/0/0 24/10/0
Do. do. 2nd		16/10/0 17/10/0
Do. do. 3rd, &c.		8/0/0 10/5/0
Do. Spruce, 1st		8/10/0 10/0/0
Do. do. 3rd and 2nd		6/10/0 7/5/0
New Brunswick		6/0/0 7/0/0
Battens, all kinds		5/0/0 21/0/0
Flooring boards, sq., 1 in. prep. 1st		0/9/0 0/14/0
Do. 2nd		0/6/0 0/11/0
Other qualities—		0/4/6 0/7/0
Cedar, Cuba	ft.	/3 /4
Honduras, &c.		/3 /4½
Mahogany, Cuba		/3½ /6
St. Domingo, cargo av.		/3½ 1/0
Mexican do. do.		/3 /4
Tobasco do. do.		/3½ /6
Honduras do.		/3½ /5½
Box, Turkey	ton	4/0/0 15/0/0
Rose, Rio		7/0/0 16/0/0
Bahia		6/0/0 15/0/0
Satin, St. Domingo		0/0/5 0/1/0

TIMBER (*continued*).

Satin, Porto Rico	0/0/6	0/1/6
Walnut, Italian	0/0/3½	0/0/7

METALS.

Iron—Pig, in Scotland	ton	2/2/8 0/0/0
Bar, Welsh, in London		5/12/6 5/15/0
Do. do. at works in Wales		5/2/6 5/5/0
Do. Staffordshire, in London		6/0/0 6/10/0
COPPER—British cake and ingot		43/0/0 43/10/0
Best selected		43/15/0 44/5/0
Sheets, strong		50/0/0 0/0/0
Chili bars		40/6/3 40/11/3
YELLOW M'TAL	lb	0/0/4½ 0/0/4¾
LEAD—Pig, Spanish	ton	9/18/9 10/0/0
English com. brands		10/1/3 10/2/6
Sheet, English, 6 lbs. per sq. ft. and upwards		10/15/0 11/0/0
Pipe		11/15/0 0/0/0
ZINC—English sheet	ton	18/10/0 19/0/0
Vieille Montagne		19/10/0 0/0/0
TIN—Straits		63/17/6 64/7/6
Australian		64/10/0 65/0/0
English Ingots		68/0/0 68/10/0
Banca		65/0/0 65/5/0
Billiton		64/10/0 64/15/0

OILS.

Linseed	ton	19/15/0 20/5/0
Cocoanut, Cochin		25/0/0 0/0/0
Do. Ceylon		23/0/0 0/0/0
Palm, Lagos		23/10/0 0/0/0
Rapeseed, English pale		22/10/0 0/0/0
Do. brown		21/0/0 0/0/0
Cottonseed ref.		17/15/0 18/15/0
Oleine		19/10/0 21/10/0
Lubricating, U.S.		4/0/0 5/0/0
Do. refined		5/0/0 12/0/0
TAR—Stockholm	barrel	1/1/0 1/1/6
Archangel		0/15/6 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

ABERTILLERY.—For new schools, Abertillery (Mon.). Mr. G. Rosser, architect, Abercarn:—

D. Davies	£6,055	Williams & Rogers	£5,376
D. Jenkins	5,950	Jones & Son	5,348
J. Linton	5,700	G. H. Wilkins	5,240
C. F. Morgan	5,636	J. Jenkins	4,915
Hatherley & Carr	5,395	A. P. Williams	4,840

BRIDGEND (Glam.).—For the execution of street improvement works, High-street, Tynewydd, for the Ogmore and Garw District Council. Mr. H. Dawkin Williams, surveyor, Blackmill, R.S.O., near Bridgend:—

Barnes & Chaplin, contractors, Cardiff £1,110 2 0

CROYDON.—For erecting a detached house, Selsdon-road. Mr. A. Broad, architect, 3, High-street, Croydon. Quantities by architect:—

Bryan & Son	£752	A. Bullock	£626
Hanscomb & Smith	689	W. Smith & Son	625
W. Marriage	680	S. Page	620
J. Smith & Sons	665	E. J. Saunders	600
D. W. Barker	633	E. P. Bulled & Co.*	593

* Accepted.

CROYDON.—Accepted for erecting a row of five cottages, Alma-place, Thornton Heath. Mr. A. Broad, architect, 3, High-street, Croydon:—

W. Smith & Son £955

[No competition.]

CROYDON.—For four semi-detached houses, Brigstock-road, Thornton Heath. Mr. A. Broad, architect, 3, High-street, Croydon:—

W. Smith & Son £2,000

[No competition.]

DENTON (Lancs.).—Accepted for the erection of a house and chapel (two contracts), for the Urban District Council. Mr. G. H. Newton, architect, District Council Offices, Denton. Quantities by the architect:—

Contract No. 1.—For the Erection of Lodge, Entrance Gates, &c.

Joseph Clayton, Denton £954

Contract No. 2.—For the Erection of Chapel.

Joseph Clayton, Denton £1,560

EGHAM.—For the erection of two detached villa residences on Egham-hill, for Mrs. Henry Loe. Mr. James W. Oades, architect, Station-road, Egham:—

W. Watson	£2,312	A. Gale	£1,925
A. Simpson	2,250	Beauchamp & Rowland, Egham*	1,820
W. Satchwell	2,135		

* Accepted.

EGHAM.—For new fire-engine station for Messrs. Gardiner Bros. Mr. James W. Oades, architect, Station-road, Egham:—

G. Gray	£365 0	Searle & Sons	£247 10
Beauchamp & Rowland	298 0	A. Simpson*	245 0

[All of Egham.]

* Accepted, subject to revision.

EGHAM.—For new stores and show-room for Messrs. Gardiner Bros. Mr. James W. Oades, architect, Station-road, Egham:—

G. Gray	£436 0 0	A. Simpson, Egham*	£314 0 0
Beauchamp & Rowland	384 17 0		

* Accepted.

GILFACH GOCH (Wales).—For the erection of thirteen cottages. Messrs. Griffiths & Jones, architects, Town Hall-buildings, Tonypandy:—

Rees & Francis	£3,055	D. Evans & Sons	£2,360
Rattery & Jenkins	2,470	E. Thomas, Ton-yr-efail*	2,145

* Accepted.

GUILDFORD.—For the erection of a billiard-room at Langley Mere, Chilworth, for Mr. W. Hartmann. Messrs. Treleaven & Payne, architects, 8, John-street, Adelphi, W.C., and 18, Acre-lane, Brixton, S.W.:—

Mitchell Bros.	£1,075	Whitehead & Co.	£945
Maxwell Bros.	984	Peacock Bros.	938

HEREFORD.—For the erection of a bridge across the Little Lugg river, for the Herefordshire County Council. Mr. Henry T. Wakelam, C.E., County Surveyor, Shire Hall, Hereford. Quantities by the County Surveyor:—

David Smith	£569 0 0	J. Preece	£493 13 2
Storre Bros.	540 6 0	Andrews & Son, Hereford*	487 19 0
Bowers & Co.	540 0 0		
W. P. Lewis & Co.	509 13 3		

* Accepted.

KETTERING.—Accepted for the construction of a covered service reservoir at Clover Hill, for the Kettering Water Company. Mr. Thomas Hennell, engineer, Delahay-street, Westminster:—

W. Cunliffe, Kingston-on-Thames £1,283 17

LLANDILO.—For stable and repairs to the Castle Hotel, for Mrs. Bowen, proprietress. Mr. David Jenkins, architect:—

Thomas Brothers	£257 0	David Evans	£249 0
Daniel Stephens	256 0	Daniel Jones, Llandilo*	223 10

* Accepted.

LLANISHEN.—For erecting house, shop, and stables, at Llanishen, for Mr. E. Williams. Mr. A. S. Mead, architect, Cardiff:—

Gould & Burns	£882 8 2	S. Hanson	£765 3 0
Cox & Bards	827 12 6	T. Cod	761 13 0
Hatherley & Carr	797 0 0	Powell & Mansfield	726 1 9
Richards & Co.	785 0 0	T. Wood & Son*	675 0 0

* Accepted.

LONDON.—For the erection of mission-house, &c., at Church-street, Shoreditch, for the Church Extension Association (Incorporated). Mr. Richard J. Lovell, architect, 46, Queen Victoria-street, E.C. Quantities by Mr. James Kennedy, 31, Great James-street, W.C.:—

Roffey	£4,972 0 1	L. H. & R. Roberts	£4,129 0 0
Dearing & Son	4,697 0 0	Patman & Fotheringham	3,896 0 0
Simpson & Son	4,521 0 0	Ivory*	3,878 0 0
Clarke & Bracey	4,435 0 0		
Colls & Sons	4,238 0 0		

* Accepted.

LONDON.—For alteration at "The Yarmouth Arms" Public-house, Lower Thames-street, London, E.C. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C.:—

W. Harper £154 0 0
T. Osborn & Sons (accepted) 152 10 0

LONDON.—Accepted for work at "The Prince of Wales" Public-house, Cambridge-heath, London, E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C.:—

T. Osborn & Sons £153 10 0

LONDON.—For painting and decorations at 122, Haverstock Hill, N.W., for Mr. W. Searle. Mr. T. Wilson, surveyor, 34, New Bridge-street, E.C.:—

W. Sumner & Co. Lim.	£108 0	J. Pugh	£80 0
W. Littlewood	102 10	C. Peck (accepted)	79 0

LONDON.—Accepted for sanitary work and decorations at 116 Haverstock Hill, N.W., for Mr. H. F. Gidden. Mr. T. Wilson, surveyor, 34, New Bridge-street, E.C.:—

W. Littlewood £183

[No competition.]

LONDON.—For alterations and shop fittings at 25, Westbourne Grove, W., for the United Kingdom Tea Company, Limited. Mr. A. G. Hennell, architect:—

Marks	£1,011 13 5	Black & Son	£863 0 0
Holloway Bros.	990 0 0	W. Sumner & Co., Limited*	848 0 0
Burman & Son	940 0 0		
Johnson & Son	940 0 0		

* Accepted.

LONDON.—Accepted for new stables and engine-house, for Messrs. Slater, Lim., Ransome's Dock, Park-road, Battersea. Mr. C. R. G. Hall, architect and surveyor, 6, Charles-street, Kensington:—

Cooke & Co. £2,200

LONDON.—For the erection of two shops, High-road, Tottenham, Mr. John E. Pinder, architect, Bridge House, South Tottenham:—

W. Bysouth £2,350

[No competition.]

LONDON.—For the completion of two shops, Seven Sisters'-road. Mr. John E. Pinder, architect, Bridge House, South Tottenham:—

Green & Smith £643 10 0

[No competition.]

LONDON.—For alterations, additions, and decorative work to "The Crown and Sceptre," No. 2, Streatham-hill, S.W., for Mr. A. E. Austin. Messrs. Treleaven & Payne, architects and surveyors, 18, Acre-lane, Brixton, S.W., and 8, John-street, Adelphi, W.C.:—

Candler & Son	£563	F. H. Hopkins	£469
Peacock Bros.	510	W. Read	465
Maxwell Bros.	504	Mould & Son	450
A. Phelps	482	Whitehead & Co., Clapham*	453

* Accepted.

LONDON.—For the erection of stabling and coach-house (Section A) at Dalberg-road, Brixton, for Mr. A. Sholl. Messrs. Treleaven & Payne, architects and surveyors, 18, Acre-lane, Brixton, S.W., and 8, John-street, Adelphi, W.C.:—

Jones	£464 0	Hammond	£347 10
Smart	436 10	Maxwell, Bros., Brixton*	345 8

* Accepted.

LONDON.—For the erection of a warehouse, Great Saffron-hill for Messrs. G. W. Munt & Sons. Mr. Wimble, architect:—

Hall, Beddall, & Co.	£2,600	E. Jones	£2,462
Ashby & Horner	2,570	E. Lawrance & Sons	2,455
Colls & Sons	2,563	Killby & Gayford	2,449
Scrivener & Co.	2,537		

LONDON.—For alterations to the "Sir Robert Peel" public-house, Malden-road, Kentish Town, N.W., for Mr. A. W. Ritchie. Mr. Albert E. Pridmore, architect, 2, Broad-street Buildings, E.C.:—

Edward Pearce	£285	Marchant & Hirst	£179
Antill & Co.	245	London & Co.	160
W. J. Wiltshire	230	Hayworth Bros.	168
S. R. Lamble	219		

LONDON.—For the supply of 125,000 Jarrah wood-paving blocks, for the St. Pancras Vestry. Mr. Wm. N. Blair, C.E., Vestry Hall, Pancras-road, N.W.:—

Shadbolt Sons & Co.	£12 10	Palfreman, Foster, & Co., New Broad-street*	£12 5
W. Griffiths	12 5		

* Accepted.

LONDON.—For painting works and repairs to the baths and washhouses, Caledonian-road, N., for the Commissioners of Baths and Washhouses for the parish of St. Mary, Islington. Mr. A. Hessel Tiltman, Architect, 6, John-street, Bedford-row, W.C.:—

J. W. Turnpenny	£535 0	Macfarlane, Bro.	£385 0
F. T. Chinchen	485 0	W. H. Coates	357 0
J. W. Martin	461 0	W. Wells	355 0
J. Riley	439 0	Yerbury & Sons	299 0
T. White & Son	422 0	G. Godson & Sons	292 0
E. Mills	389 10	J. Frewing	245 0

MANCHESTER.—For levelling and laying-out recreation ground, building boundary-wall, &c., at the Ancoats Hospital, Mill-street. Mr. W. Cecil Hardisty, architect, Queen's Chambers, John Dalton-street:—

R. Neill & Sons	£530 0	A. Turnbull (accepted)	£437 0
J. Barratt	439 10		

NEW BASFORD (Notts).—For the erection of two pairs of semi-detached houses, Springfield Grove Estate. Mr. A. H. Goodall, architect, Market-street, Nottingham. Quantities by the architect:—

Hoyes & Boyfield	£1,560 0 0	J. Cooper	£1,350 0 0
Gilbert & Gabbitass	1,525 0 0	J. Wheatley	1,340 0 0
A. B. Clarke	1,500 0 0	G. Caulton	1,322 0 0
J. Attenborrow	1,450 0 0	G. T. Lovett	1,307 7 6
J. J. Adams	1,436 4 0	W. Pinkett	1,300 0 0
L. Green	1,407 10 0	F. Evans	1,295 0 0
R. Fisher	1,398 0 0	J. Oscroft	1,292 0 0
T. Whittaker	1,398 0 0	H. Scott & Son	1,290 0 0
A. G. Bell	1,392 0 0	F. Wartnaby	1,283 0 0
H. Andrew	1,363 0 0	Appleby & Lambert	1,282 0 0
W. Geil & Son	1,360 0 0	G. A. Pillatt	1,270 0 0
T. Cuthbert	1,355 12 0	W. Maule, Basford*	1,267 0 0
B. Keeling	1,350 0 0		

* Accepted for one pair.

PETERBOROUGH.—For the erection of four dwelling-houses, Dogsthorpe-road, for Mr. Christian. Mr. J. G. Stallebrass, architect, North-street, Peterborough. Quantities by the architect:—

Bailey	£798 0 0	Bridgefoot	£755 0 0
Watson & Spriggs	780 0 0	Binder	748 0 0
Rowe	773 0 0	Sibley	725 0 0
Jellings	762 2 4	Cracknell	708 0 0
Pape	760 0 0	Gutteridge (accepted)	682 0 0

[All of Peterborough.]

PLYMOUTH.—For the erection of warehouse, No. 29 and 30, Kinterbury-street, Plymouth, for Messrs. W. H. Hodge & Son. Mr. James Harvey, architect, 9, Courtenay-street, Plymouth. Quantities by architect:—

Roach & Lovell	£1,500	Goad	£1,250
Blackell & Shepherd	1,499	Jenkin & Son	1,235
Palmer	1,365	Wakeham Bros.	1,185
Blowey	1,350	Blake	1,139
Trevena	1,319	Pearn & Sons	1,089
Goad & Co.	1,297	Coles*	1,070
May	1,295		

* Accepted with slight modification.

RODBOROUGH.—For building Rodborough Church, Rodborough, near Stroud. Messrs. F. S. Waller & F. W. Waller, architects, Gloucester:—

D. C. Jones & Co.	£3,310 0 0	Hatherley & Carr	£2,662 0 0
Henry R. Beavis	3,057 0 0	Stephen Cox	2,487 0 0
Dolman & Ponting	3,049 0 0	King & Sons	2,338 0 0
Jesse Freeman	3,007 0 0	A. S. Cook*	2,253 1 8
W. Jones	2,786 0 0	E. Beavis	2,239 1 9
W. Cowlin & Sons	2,688 0 0		

* Accepted in part.

SHEFFIELD.—For additions to Workhouse Infirmary, for the Penistone Union Guardians. Mr. G. A. Wilde, architect, Bank-street, Sheffield:—
Albert Wainright, Thurlstone, nr. Penistone £1,130

SOUTHAMPTON.—For building four houses in Chamberlayne-Place, Southampton. Mr. F. Crook, surveyor:—
J. Nichol .....£2,150 | W. Reeves (accepted) £1,640
J. Treheame ..... 1,728 | G. Harris 1,636
[No quantities.]

STOKE BISHOP.—For the erection of walls at Downside, Stoke Bishop, near Bristol. Messrs. P. Munro & Son, architects, Bristol:—
Estabrook .....£724 | Perkins £577
Hatherley & Carr..... 585 | Beaver 563

WIMBLEDON.—For the erection of two houses in Wycliffe-road, for Mr. Ward. Messrs Treleaven & Payne, architects and surveyors, 18, Acre-lane, Brixton, S.W., and 8, John-street, Adelphi, W.C.:—
W. Brooks £790

WIMBLEDON.—For the construction of culverts and manholes for the Wimbledon Urban District Council. Mr. C. H. Cooper, engineer and surveyor:—
J. Kavanagh.....£1,133 8 2 | Mayo & Co.....£983 0 0
E. Iles..... 1,172 0 0 | W. Cunliffe, Kingston* 978 4 0
G. Bell 1,094 0 0
T. Adams..... 1,069 0 0
* Accepted.

WOLVERHAMPTON.—For building "malting and premises" at Wolverhampton, for the Wolverhampton and Dudley Breweries, Limited. Mr. J. D. Wood, architect, Birmingham:—
Henry Lovatt .....£6,384 | G. Hodges.....£5,600
Merton Hughes ..... 5,671 | Guest & Son..... 5,550
Gowing & Ingram..... 5,500 | C. A. Horton 5,453
John Dallow..... 5,850 | Alfred Lynex 5,450
E. Giles ..... 5,800 | Lowe & Sons 5,395
Harley & Son ..... 5,787 | Willcock & Co., Wolverhampton* 5,315
Thomas Tildesley..... 5,625
* Accepted.

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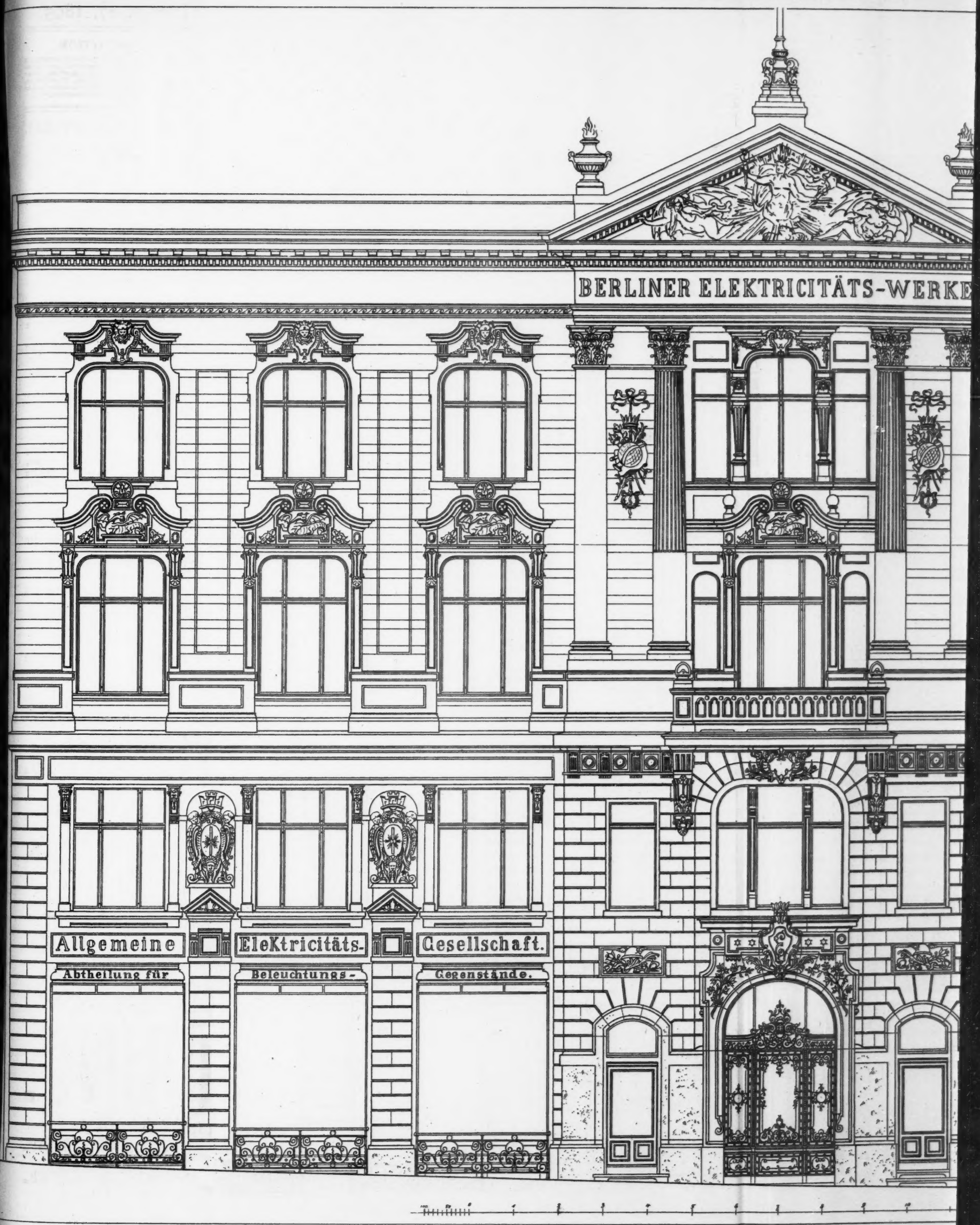

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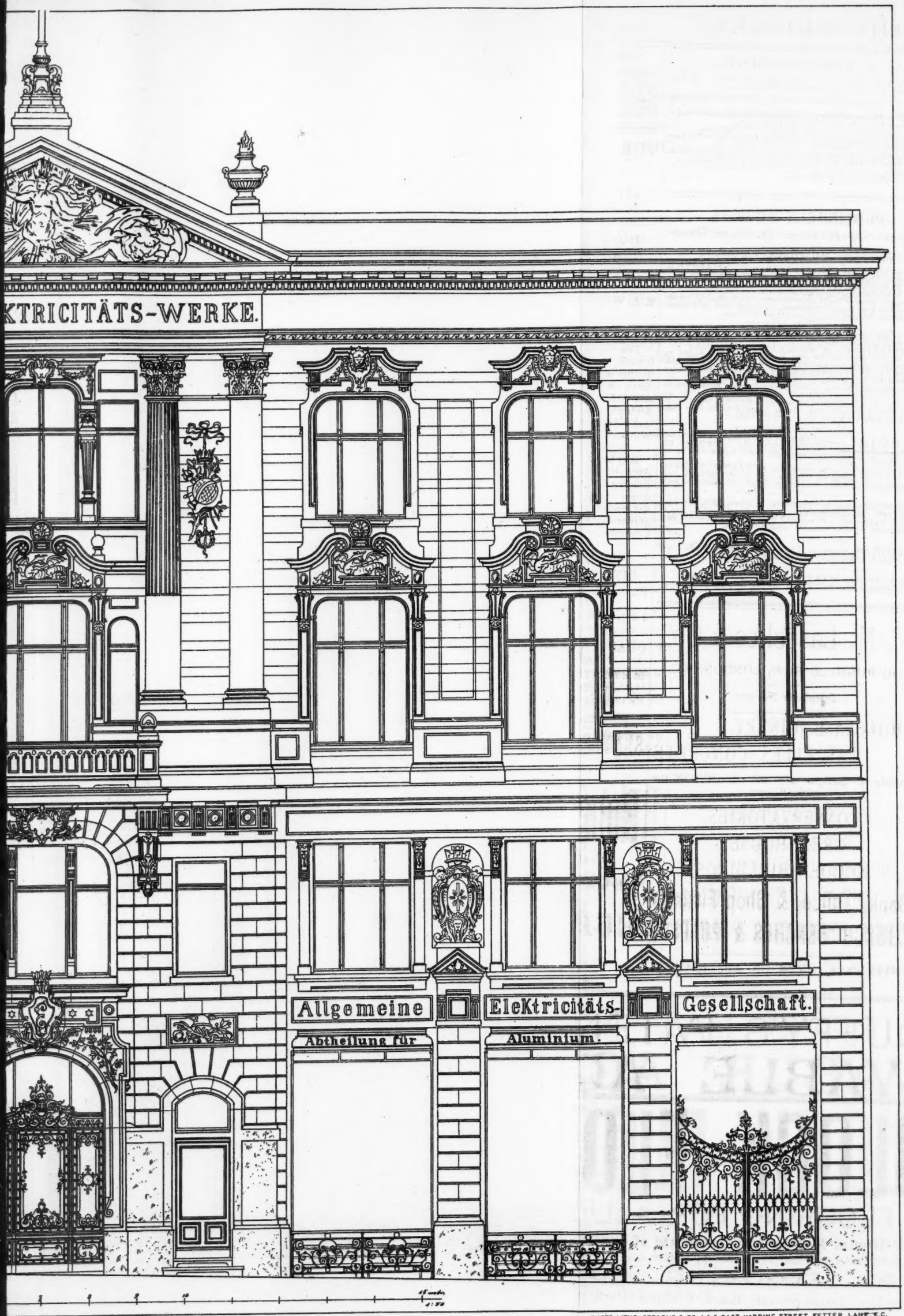

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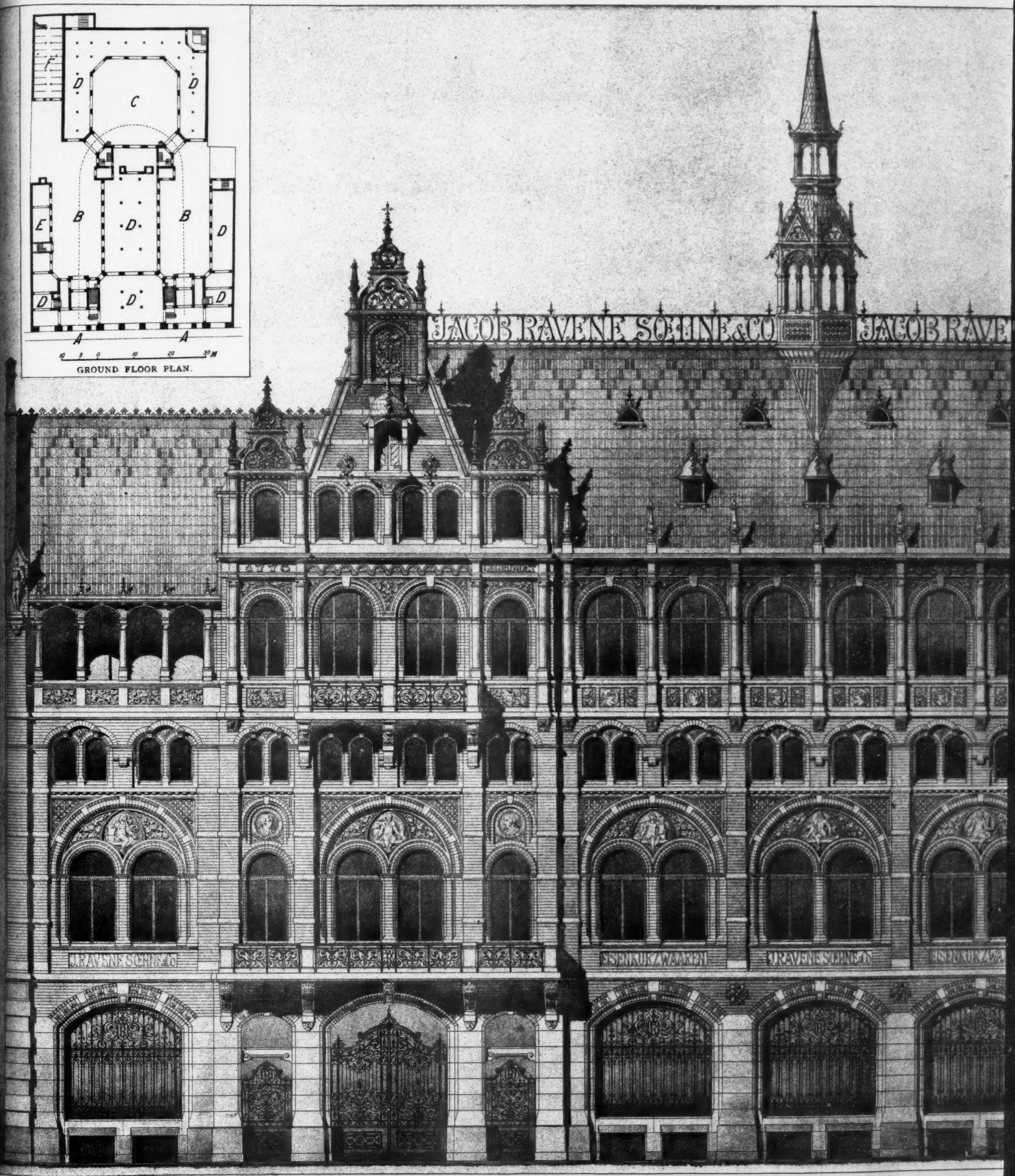
ET ARCHITECTURE.

UPPLY COMPANY.—Messrs. Cremer & Wolffenstein, Architects.

GROUND FLOOR PLAN.



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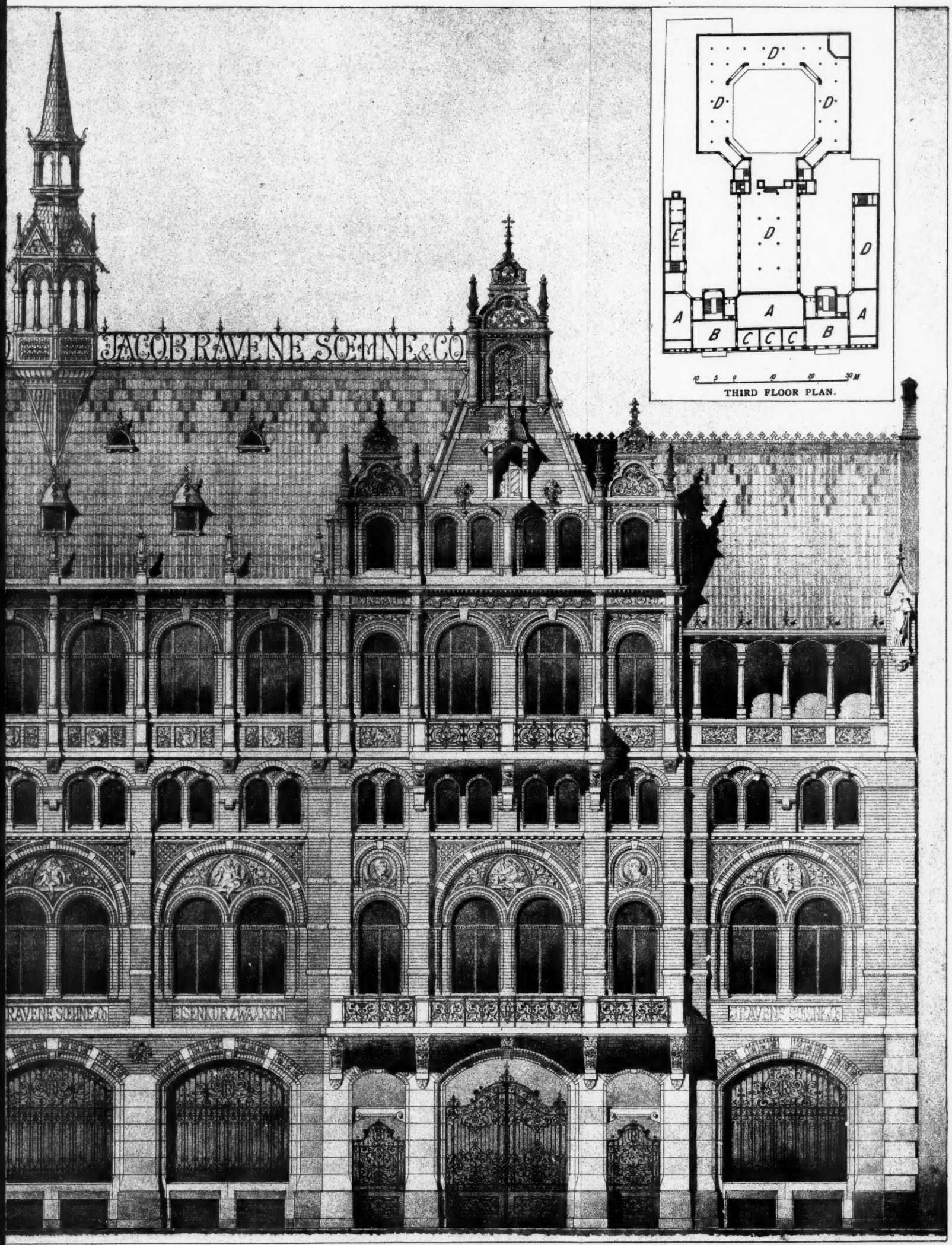

THIRD FLOOR PLAN.

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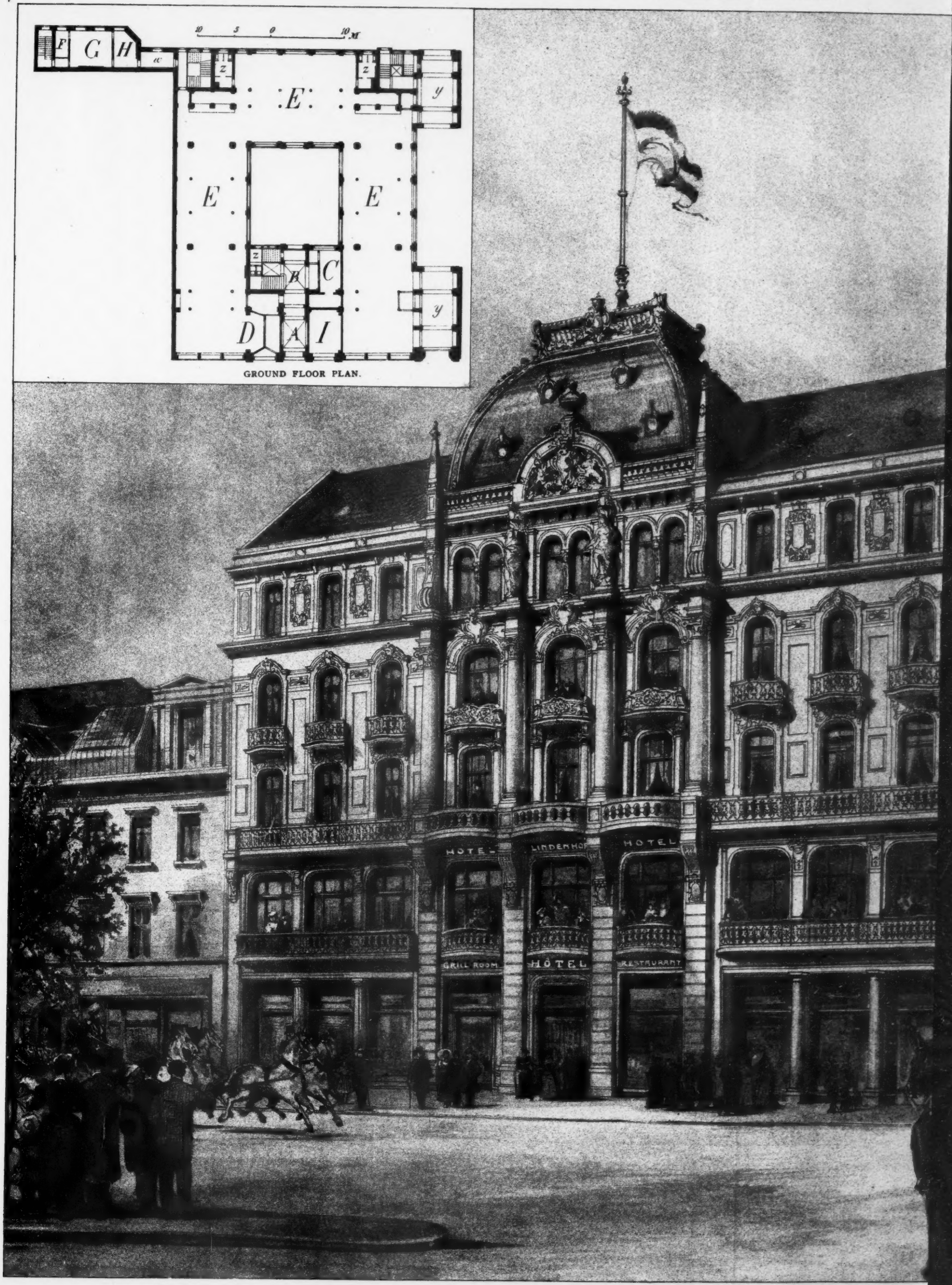
REET ARCHITECTURE.

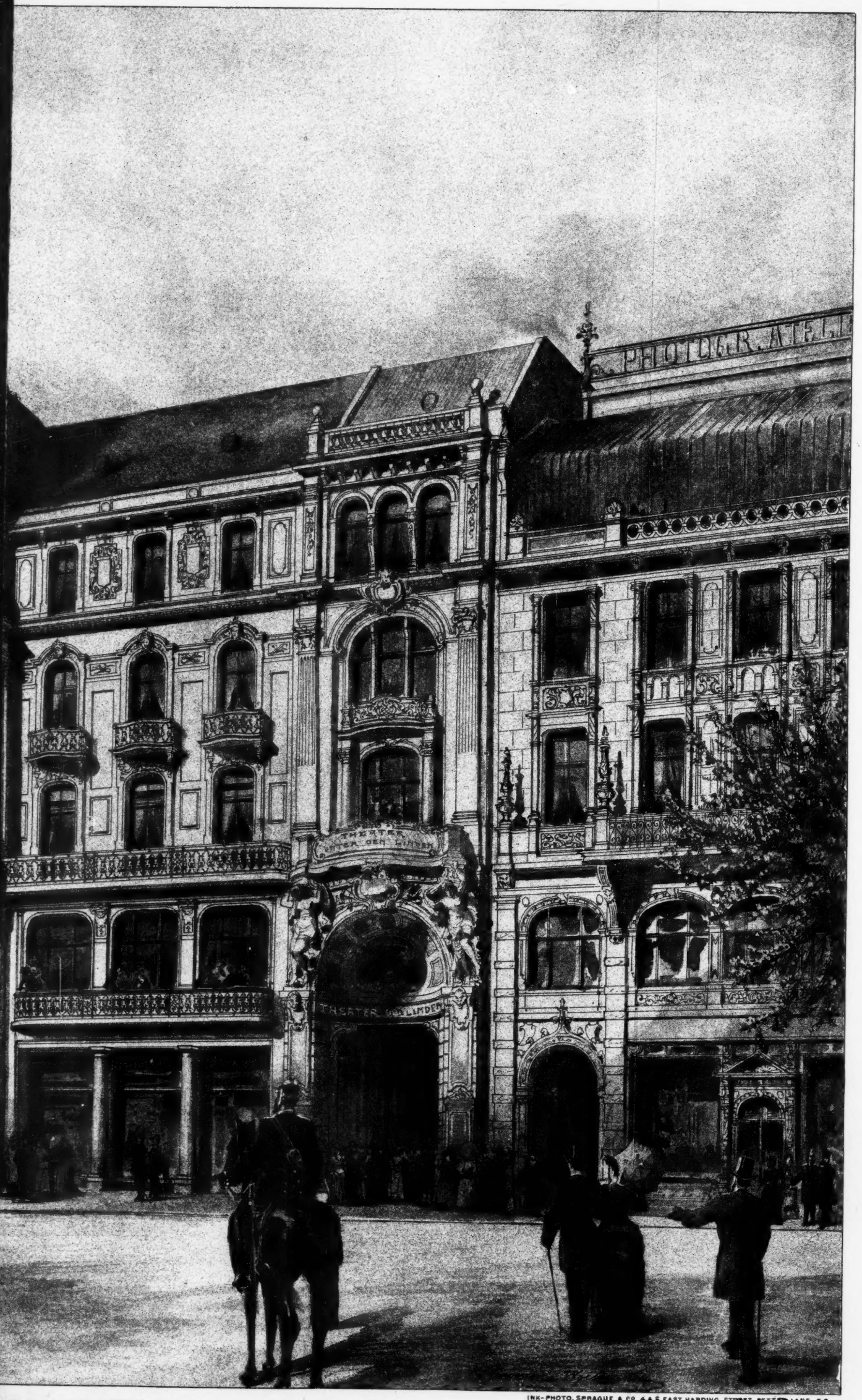
, BERLIN.—Messrs Ende & Boeckmann, Architects.

GROUND FLOOR PLAN.



BERLIN STREET ARCHITECTURE.

WESTMINSTER HOTEL, BERLIN.—Messrs. Cremer & Wolffenstein,



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REET ARCHITECTURE.

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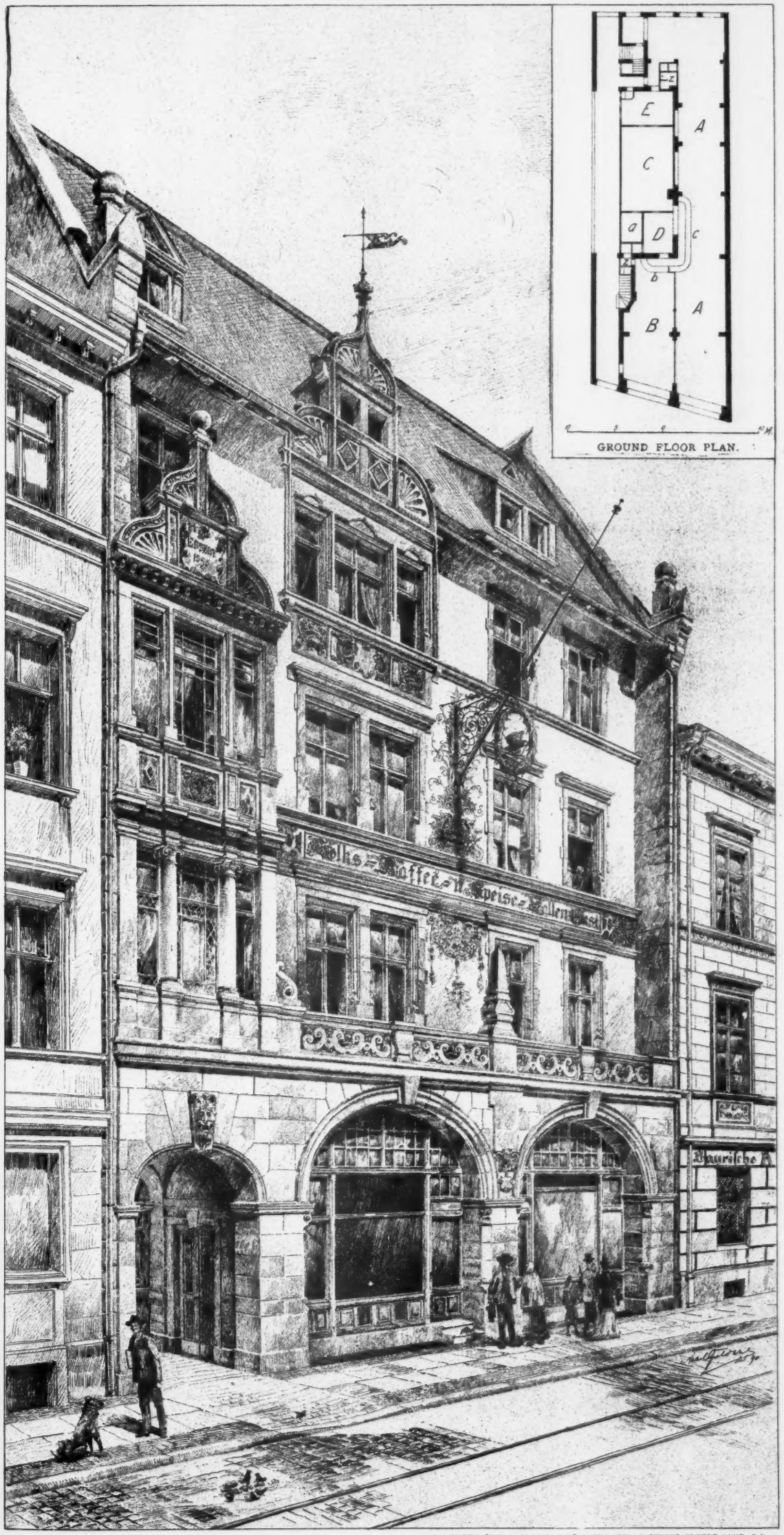

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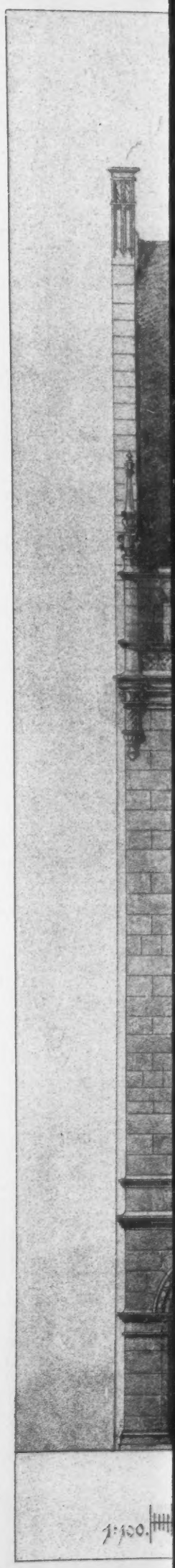

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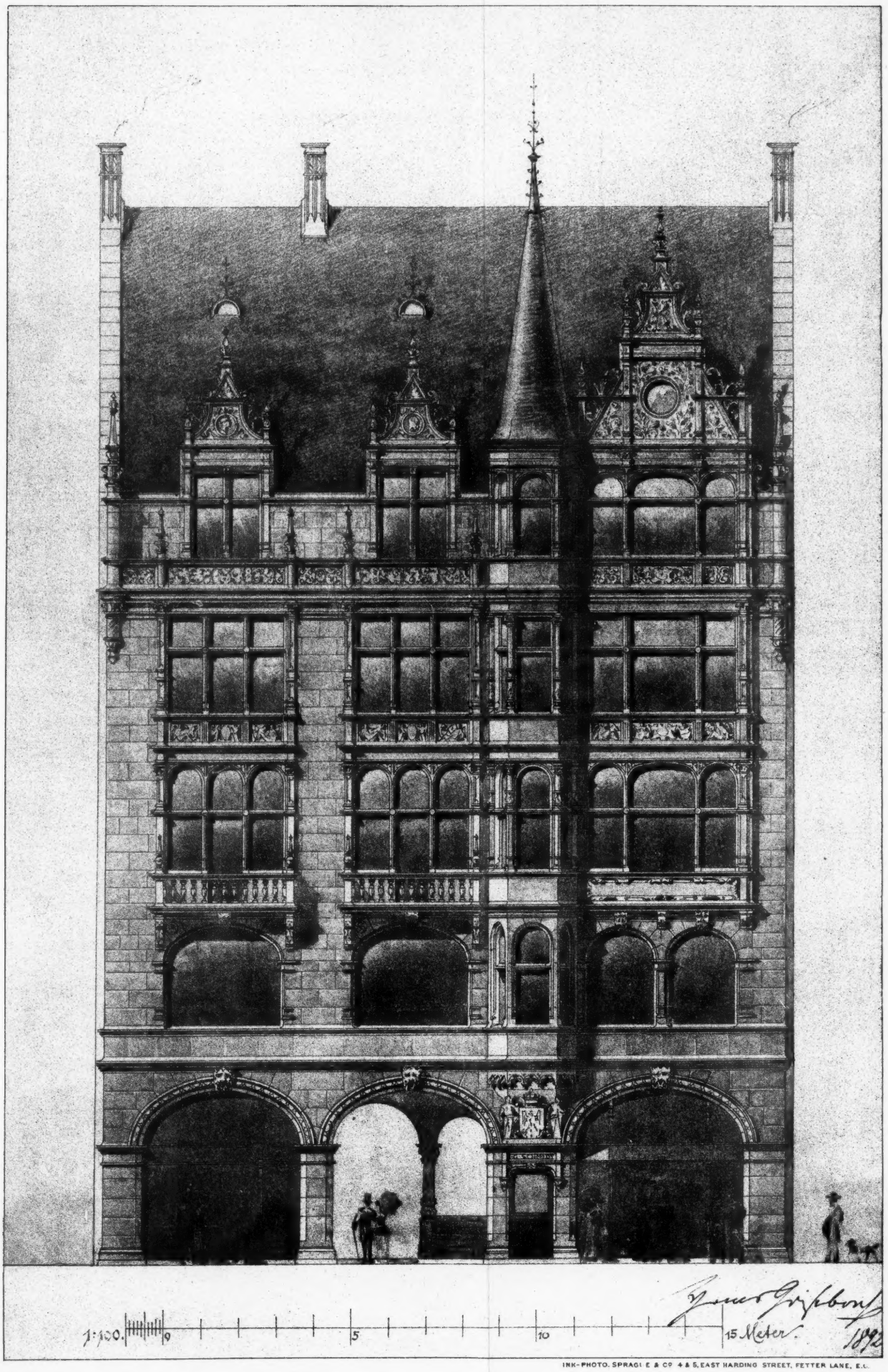

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